

2010

Selecting tools for ACAT assessment: a report for the Expert Clinical Reference Group, Aged Care Assessment Program, Department of Health and Ageing: 1 September 2010

Janet Sansoni
University of Wollongong, jans@uow.edu.au

Nick Marosszeky
Macquarie University, marossz@uow.edu.au

Glenn Fleming
University of Wollongong, gfleming@uow.edu.au

Emily Sansoni
Australian National University, University of Wollongong, emily_sansoni@uow.edu.au

Follow this and additional works at: <https://ro.uow.edu.au/ahsri>

Selecting tools for ACAT assessment: a report for the Expert Clinical Reference Group, Aged Care Assessment Program, Department of Health and Ageing: 1 September 2010

Abstract

The National ACAT Review (Communio, 2007) recommended that Aged Care Assessment Program (ACAP) Officials seek expert advice to identify a set of specific assessment tools that were valid for use by the ACAP and to develop criteria for their use by Aged Care Assessment Teams (ACATs).

Keywords

report, aged, care, clinical, reference, program, group, expert, september, 2010, selecting, acat, tools, assessment, health, ageing, department, 1

Publication Details

J. Sansoni, N. Marosszeky, G. Fleming & E. Sansoni, Selecting tools for ACAT assessment: a report for the Expert Clinical Reference Group, Aged Care Assessment Program, Department of Health and Ageing: 1 September 2010 (Centre for Health Service Development, University of Wollongong, 2010).

[http://www.health.gov.au/internet/main/publishing.nsf/Content/743788BA3F939C44CA257BF00020AAFD/\\$File/ECRG%20Final%20Report.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/743788BA3F939C44CA257BF00020AAFD/$File/ECRG%20Final%20Report.pdf)

Selecting Tools for ACAT Assessment: A Report for the Expert Clinical Reference Group, Aged Care Assessment Program, Department of Health and Ageing

*SelectingToolsforACATAssessmentSelectingToolsforACATAssessmentSelectingT
oolsforACATAssessmentSelectingToolsforACATAssessmentSelectingToolsforAC
ATAssessmentSelectingToolsforACATAssessmentSelectingToolsforACATAsses
smentSelectingToolsforACATAssessmentSelectingToolsforACATAssessmentSele
ctingToolsforACATAssessmentSelectingToolsforACATAssessmentSelectingTool
sforACATAssessmentSelectingToolsforACATAssessmentSelectingToolsforACATAs
essmentSelectingToolsforACATAssessmentSelectingToolsforACATAssessment
SelectingToolsforACATAssessmentSelectingToolsforACATAssessmentSelectingT
oolsforACATAssessmentSelectingToolsforACATAssessmentSelectingToolsforAC
ATAssessmentSelectingToolsforACATAssessmentSelectingToolsforACATAsses
smentSelectingToolsforACATAssessmentSelectingToolsforACATAssessmentSele
ctingToolsforACATAssessmentSelectingToolsforACATAssessmentSelectingTool
sforACATAssessmentSelectingToolsforACATAssessmentSelectingToolsforACATAs
essmentSelectingToolsforACATAssessmentSelectingToolsforACATAssessment
SelectingToolsforACATAssessmentSelectingToolsforACATAssessmentSelectingT
oolsforACATAssessmentSelectingToolsforACATAssessmentSelectingToolsforAC*

Centre for Health Service Development



1 September 2010

*This report was prepared on behalf of the
Aged Care Assessment Program Expert Clinical Reference Group*

Dr Susan Hunt (Chair)	Senior Clinical Adviser, Ageing and Aged Care Division, Department of Health and Ageing
Professor Jenny Abbey	Clinical Professor, Faculty of Health Sciences, University of Adelaide, Adjunct Professor, Queensland University of Technology, Research Fellow, Menzies Institute, University of Tasmania
Assoc Prof Gideon Caplan	Director, Post Acute Care Services, the Prince of Wales Hospital PACS Unit, NSW
Dr Terence Finnegan	Aged Care and Rehabilitation Department, Royal North Shore Hospital, NSW
Professor Leon Flicker	Director, WA Centre for Health and Ageing, Royal Perth Hospital, WA
Ms Therese Gehrig	Manager, Aged and Community Care Policy, ACT Health, (ACAP Official representative)
Ms Wendy Hubbard	Executive Director, Allied Health, Ballarat Health Services, Victoria
Dr Brendan Kay	General Practitioner, Jamieson Street Medical, Victoria
Assoc Prof Michael Murray	Director, Geriatric Medicine , St Vincent's Hospital, Victoria
Mr Tony Pyke	Manager, Adelaide Metro Aged Care Assessment Team, Domiciliary Care South Australia (ACAT Member representative)
Ms Michelle Roffey	Director, ACAP Section, Department of Health and Ageing
Assoc Prof Janet Sansoni	Associate Professor, Australian Health Outcomes Collaboration, ACT; Centre for Health Service Development, University of Wollongong
Ms Trudy Sutton	Manager, Business Development, ACH Group, SA
Ms Jenny Stevens	Area Director Aged Care WA Country Health Service, WA
Dr Eddy Strivens	Regional Geriatrician, Aged Care Health Services, Queensland Health
Assoc Prof Paul Varghese	Director, Geriatric and Rehabilitation Unit Princess Alexandra Hospital, Queensland
Ms Wendy Venn	Aged Care Nurse Practitioner, Aged Care and Rehabilitation Unit, ACT
Ms Elizabeth Lovell	Assistant Director, ACAP Section, Department of Health and Ageing (Secretariat)
Ms Helena Kujansuu	ACAP Section, Department of Health and Ageing (Secretariat)

Authors:

Janet Sansoni

Nick Marosszeky

Glenn Fleming

Emily Sansoni

Suggested Citation:

Sansoni J, Marosszeky N, Fleming G and Sansoni E (2010) *Selecting Tools for ACAT Assessment: A Report for the Aged Care Assessment Program (ACAP) Expert Clinical Reference Group*. Centre for Health Service Development, University of Wollongong. Report for the Aged Care Assessment Program, Australian Government Department of Health and Ageing, Canberra

Acknowledgements:

Review of the KICA Assessment Battery was completed by Dr Kate Smith and Professor Leon Flicker, Western Australian Centre for Health and Ageing (WACHA)

Table of Contents

1	EXECUTIVE SUMMARY	1
1.1	ECRG Recommended Assessment Tools by Domain -----	2
1.2	ECRG Recommended Next Steps -----	3
2	INTRODUCTION	4
2.1	ECRG Recommended Assessment Tools by Domain -----	5
2.2	ECRG Recommended Screening Items -----	5
3	PHYSICAL FUNCTION	6
3.1	Recommended Screening Items -----	6
3.2	Other Potential Screening Items: Physical Function -----	16
3.3	Reviewed Core Assessment Instruments: Physical Function -----	16
3.4	Suggested Follow-up Instruments: Physical Function -----	19
4	COGNITIVE FUNCTION	24
4.1	Suggested Screening Items: Cognitive Function -----	24
4.2	Other Potential Screening Items: Cognitive Function -----	27
4.3	Reviewed Core Assessment Instruments: Cognitive Function -----	28
4.4	Suggested Follow-up Instruments: Cognitive Function -----	32
5	BEHAVIOURAL AND PSYCHOLOGICAL ASSESSMENT	33
5.1	Depression/Mental Health -----	33
5.2	Dementia, Behaviours of Concern, and Delirium Items -----	35
5.3	Suggested Follow-up Instruments: Behavioural and Psychological Assessment -----	36
6	ASSESSMENT OF SOCIAL FUNCTION	38
6.1	Suggested Screening Items -----	38
6.2	Suggested Follow-up Instruments: Social Function -----	42
7	CONCLUSION AND RECOMMENDATIONS	43
7.1	ECRG Recommended Assessment Tools by Domain -----	43
7.2	ECRG Recommended Next Steps -----	45
8	REFERENCES	46
	ATTACHMENT 1: THE EVALUATION FRAMEWORK	55
	ATTACHMENT 2: PROPOSED SCREENING ITEMS FOR ACAT ASSESSMENT	65
	General and Preliminary Items -----	65
	Physical Function: Screening Items -----	65
	Cognitive Function Screening Items -----	69

Behavioural and Psychological Screening Items-----	69
Social Function Screening Items-----	70
ATTACHMENT 3: EXAMPLES OF RECOMMENDED CORE ASSESSMENT INSTRUMENTS.....	73
Caveat-----	73
Modified Barthel Index of Activities of Daily Living (with Collin Scoring)-----	73
OARS-IADL Items-----	76
KICA-ADL:-----	77
Standardized Mini Mental State Examination (SMMSE)-----	78
KICA-COG: COGNITIVE ASSESSMENT-----	82
The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE; short version)-----	84
KICA-Carer: COGNITIVE INFORMANT REPORT-----	87
Rowland Universal Dementia Assessment Scale-----	88
ATTACHMENT 4: INSTRUMENT REVIEWS CONCERNING PHYSICAL FUNCTION	97
Barthel Index-----	97
OARS-IADL-----	111
ATTACHMENT 5: INSTRUMENT REVIEWS FOR COGNITIVE FUNCTION.....	123
Standardised Mini Mental State Examination-----	123
Modified Mini-Mental State (3MS) Examination-----	132
KICA Assessment Battery-----	150
IQCODE-----	157
Rowland Universal Dementia Assessment Scale-----	170
ATTACHMENT 6: OTHER RELEVANT INSTRUMENT REVIEWS FROM THE DEMENTIA OUTCOMES MEASUREMENT SUITE.....	177
Geriatric Depression Scale-----	177
Cornell Scale for Depression in Dementia-----	196
ATTACHMENT 7: MEMBERSHIP OF THE ACAP ECRG.....	212

List of Tables

Table 1	Summary of Ratings for Functional Assessment Instruments.....	17
Table 2	Summary of Ratings for Cognitive Assessment Instruments	29
Table 3	Australian Health Outcomes Collaboration Instrument Review Sheet 2009 (ACAP ECRG Revision)	57
Table 4	Table of Criteria and Weights for Instrument Ranking	63
Table 5	Sample Instrument Comparison Table 2009.....	64

1 Executive Summary

The *National ACAT Review* (Communio, 2007) recommended that Aged Care Assessment Program (ACAP) Officials seek expert advice to identify a set of specific assessment tools that were valid for use by the ACAP and to develop criteria for their use by Aged Care Assessment Teams (ACATs).

The ACAP Expert Clinical Reference Group (ECRG) was established in June 2009 to provide advice on the selection of validated assessment tools appropriate for ACATs to use in a comprehensive assessment of frail, older people. The ACAP ECRG also advised that a set of screening questions should be developed to enable an ACAT assessor to identify when further assessment may be required.

In October 2009 the Department of Health and Ageing engaged the Centre for Health Service Development, University of Wollongong to develop the evaluation framework for the proposed comprehensive review of a number of prospective assessment tools that may be used by ACATs. The evaluation framework is provided at Attachment 1.

A large number of potential tools and screening items were initially identified by the Department of Health and Ageing which were considered by the ACAP ECRG. Members agreed to the proposed evaluation framework and nominated the assessment tools and screening questions for review. The Department of Health and Ageing engaged the University of Wollongong to:

1. Examine and briefly discuss a range of proposed screening items suggested by the ACAP ECRG for use in all ACAT assessments.
2. Review the core assessment instruments recommended by the ACAP ECRG for use in all ACAT assessments.
3. Identify and discuss relevant follow-up assessment instruments for areas of assessment identified by the ACAP ECRG and locate existing recent reviews of these instruments.
4. Prepare a report from the ECRG detailing its recommendations and justification of the selection of assessment tools and screening questions.

The use of standard screening items and assessment tools will assist all ACAT assessors in providing a more consistent assessment. In addition, a standardised process will assist in the accurate completion of the Aged Care Client Record (ACCR) which will improve the quality and reliability of ACAP Minimum Dataset.

In Sections 3-6 of this report, each of the domains of assessment, physical, cognitive, behavioural, psychological and social function, is discussed. Each domain has a set of screening questions, a list of which can be found in Attachment 2. Examples of the recommended core assessment tools can be found at Attachment 3.

1.1 ECRG Recommended Assessment Tools by Domain

Core assessment instruments are those which assess functional domains that are relevant to every ACAT assessment including cognitive function, Activities of Daily Living [ADL] and Instrumental activities of daily living [IADL] functional skill assessments. Other assessment instruments are recommended for follow up or a more in-depth assessment if the relevant screening question identifies that a client may have a potential problem, for example falls or depression.

A number of standardised assessment instruments are recommended for the assessment of cognition and physical function. These instruments have been comprehensively reviewed using the Australian Health Outcomes Collaboration Instrument Review Sheet 2009 (ACAP ECRG Revision), scored on relevant criteria and then compared with similar instruments (refer to the evaluation framework in Attachment 1). It is noted that a number of the comprehensive reviews from the Dementia Outcomes Measurement Suite (Sansoni et al., 2008) have been used to provide some of this comparative data (refer Attachments 4 to 6). The reviewed measures are all easy to use and score, and were all found to have adequate reliability and validity.

1.1.1 Physical Function

The ACAP ECRG recommends that every person receives an assessment of their functional capacity. The recommended instruments for the assessment of physical function (ADL and IADL components) are:

- Barthel Index with Collin scoring (Collin and Wade, 1988)
- KICA-ADL (Smith et al., 2009; Stevenson et al., 2008): ADL and IADL assessment for Indigenous people living in rural or remote areas
- OARS-IADL for the assessment of Instrumental Activities of Daily Living (Fillenbaum and Smyer, 1981).

The instruments recommended for the follow-up assessment of some dimensions of physical function are:

- Pain - The Brief Pain Inventory - Short (Cleeland, 1991), the Abbey Pain Tool (Abbey et al., 2004) or the Residents Verbal Brief Pain Inventory (Australian Pain Society, 2005)
- Dental - Questions from the South Australian Oral Health Referral Pad. The Oral Health Assessment Tool (Chalmers et al., 2005) could also be considered for use by ACAT assessors where there is limited access to a dental practitioner, for example in rural and remote areas
- Continence - the Revised Urinary Incontinence Scale and the Revised Faecal Incontinence Scale (Sansoni et al., 2006).

A number of Falls Assessment Tools were examined but none are recommended.

1.1.2 Cognitive Function

The ACAP ECRG recommends that every person receives a cognitive assessment. The recommended cognitive assessment instruments are:

- Standardised MMSE (Molloy et al., 1991)
- KICA-Cog and KICA-Carer (LoGiudice et al., 2006); for Indigenous people living in rural or remote areas
- IQCODE (Jorm et al., 2004); to supplement the cognitive assessment of people with dementia
- RUDAS (Storey et al., 2004); for people from Culturally and Linguistically Diverse Backgrounds.

No assessment instruments are recommended for follow up cognitive assessment as referral to an appropriate medical practitioner is advised.

1.1.3 Behavioural and Psychological Function

The ACAP ECRG does not recommended a core assessment instrument for the assessment of a person's behavioural and psychological function. However the ACAP ECRG, recommends the 15 item Geriatric Depression Scale (GDS) as a follow up tool for most people, noting that an alternative method of assessment may be more appropriate for those people with moderate to severe dementia.

1.1.4 Social Function

The ACAP ECRG does not recommended any core assessment or follow up instruments for the assessment of a person's social function.

1.2 ECRG Recommended Next Steps

An appropriate form needs to be developed to incorporate the recommended screening items and the assessment instruments. The ACAP ECRG recommends that consideration is given to the development of an electronic form to supplement the Aged Care Client Record and integrate the administrative and assessment processes in one common electronic system. As the ACAT completes the screening items and assessment tools the responses could populate the relevant sections of the ACCR.

The ACAP ECRG recommends that a pilot study is undertaken using the recommended assessment instruments and screening items. A pilot study would enable the refinement of these components prior to any broader implementation. A pilot would also be useful to assess the psychometric properties of some of the new and/or revised screening items suggested by the ACAP ECRG. To assess the reliability and validity of the screening items a large sample size would be required.

The implementation of a standardised approach to assessment has implications for the training of ACAT assessors. The ACAP ECRG recommends the development of a Tool Kit, as a companion volume to the Aged Care Assessment and Approval Guidelines. This would include instructions on how to use and interpret all screening items, core assessment instruments and follow up assessment instruments. Standard forms should be developed for all instruments. The training material would also include possible follow-up strategies and referral pathways. In addition, the use and interpretation of the assessment instruments and screening items should also be included in the ACAP National Training Strategy for ACAT Assessors.

2 Introduction

The *National Review of ACATs* (Communio, 2007) recommended that Aged Care Assessment Program (ACAP) Officials seek expert advice to identify a set of specific assessment tools that were valid for use by the ACAP and to develop criteria for their use by Aged Care Assessment Teams (ACAT).

ACAP Officials strongly supported the development and use of standardised assessment tools to improve consistency of ACAT assessments and recommendations. The adoption of a set of standardised assessment tools for ACATs will also improve equitable access to services and be an important building block in achieving a stronger relationship between the outcome of assessments and the appropriate level of care.

The ACAP Expert Clinical Reference Group (ECRG) was established by the ACAP Section, Department of Health and Ageing in June 2009 to provide advice on the selection of validated tools appropriate for ACATs to use in the comprehensive assessment of older people referred for assessment for community and residential aged care services. The work of the ECRG will contribute to improving and strengthening the ACAP through improvement in timeliness and consistency of ACAT assessments. A list of the ECRG members is at Attachment 7.

While some ACAT teams already use assessment tools to assess aspects of cognition and function, nationally a diverse range of tools is used. Encouraging ACATs to use the recommended assessment tools should lead to greater consistency of ACAT assessments and decision making, as well as improved outcomes for both clients and service providers. The use of standardised screening questions will enable an ACAT assessor to identify when further assessment may be required.

Implementation of the core assessment instruments, screening items and follow-up assessment tools that are recommended by the ECRG will also facilitate the systematic gathering of information required for the completion of the Aged Care Client Record (ACCR). In addition, improved accuracy in the collection of the ACAP Minimum Dataset could improve the quality and reliability of data analysis.

In October 2009 the Department of Health and Ageing engaged the Centre for Health Service Development, University of Wollongong to develop an evaluation framework for a review of a number of prospective ACAT assessment tools. The evaluation framework agreed by the ACAP ECRG includes an ACAP revision of the Australian Health Outcomes Collaboration Instrument Review Sheet 2009. The evaluation framework is provided at Attachment 1.

The Department of Health and Ageing engaged the Centre for Health Service Development to:

1. Examine and briefly discuss a range of proposed screening items suggested by the ACAP ECRG for use in all ACAT assessments.
2. Review the core assessment instruments recommended by the ACAP ECRG for use in all ACAT assessments.
3. Identify and discuss relevant follow-up assessment instruments for areas of assessment identified by the ACAP ECRG and locate existing recent reviews of these instruments.
4. Prepare a report from the ECRG detailing its recommendations and justification of the selection of assessment tools and screening questions.

This report discusses each of the domains of assessment including physical, cognitive, behavioural and psychological, and social function. Each section discusses the development of screening items for each domain including the recommended follow-up tools and where relevant, a

description of the recommended core assessment tools. The comprehensive reviews of the recommended core assessment tools for physical and cognitive domains of assessment can be found in Attachments 4 and 5 respectively. Example of the recommended core assessment tools are at Attachment 3. Other relevant reviews from the DOMS report (Sansoni et al., 2008) can be found in Attachment 6. The conclusions and recommendations are discussed in Section 7.

2.1 ECRG Recommended Assessment Tools by Domain

Core assessment instruments are those which assess functional domains that are relevant to all ACAT assessments and include cognitive function, ADL and IADL functional skill assessments. Other instruments identified could be considered more appropriate for follow up, or a more in-depth assessment if a client is identified as having potential problems in this area of functioning, for example a particular behavioural symptom or issue.

This report examines and reviews the core assessment instruments and identifies a number of follow up instruments. While the suggested follow up assessment instruments are discussed in some detail, these instruments have not been reviewed in the evaluation framework. Instead existing reviews of the follow up instruments, such as those available from the Dementia Outcomes Measurement Suite project (Sansoni et al., 2008) have been utilised.

A number of standardised instruments are recommended for the assessment of cognition: Standardised MMSE (Molloy et al., 1991); KICA-Cog and KICA-Carer (LoGiudice et al., 2006; Smith et al., 2009; Stevenson et al., 2008) IQCODE (Jorm et al., 2004) RUDAS (Storey et al., 2004). For the assessment of functional skills: the Barthel Index with Collin scoring, Mahoney and Barthel, 1965; Collin and Wade, 1988) and the KICA-ADL, (Smith et al., 2009; Stevenson et al., 2008); and the OARS-IADL for the Assessment of Instrumental Activities of Daily Living (Fillenbaum and Smyer, 1981) are recommended.

These instruments have been comprehensively reviewed using the evaluation framework and scored on relevant criteria and then compared with similar tools covering this area of assessment (refer to the evaluation framework in Attachment 1). It is noted that a number of the comprehensive reviews from the Dementia Outcomes Measurement Suite (Sansoni et al., 2008) have been used to provide some of this comparative data (refer Attachments 4 to 6).

2.2 ECRG Recommended Screening Items

The proposed screening items have been largely drawn from existing instruments or from assessment forms for aged care assessment that are currently used or under development in Australia. These include the InterRAI HC (Morris et al., 2009); the Ongoing Needs Identification (ONI-N) (Samsa et al., 2008), the Aged Care Community Needs Assessment – Revised (ACCNA-R) (AACCS, 2010), the draft Aged Care Assessment Service Common Assessment Form (ACAS-CAF) (Department of Health, Victoria).

The inclusion of some of the suggested items was, however, subject to their availability. Where copyright issues relating to specific tools were identified, similar items from other assessment tools or frameworks in the public domain were sourced. Commonly used tools or framework such as the ONI-N or ACCNA-R and the draft ACAS CAF have been examined, but an extensive literature search for equivalent or similar items was outside the scope of this project. A summary of the recommended screening items is at Attachment 2.

3 Physical Function

The assessment of a person's capacity to perform daily living tasks is necessary to determine whether assistance to remain living independently is required or whether other options should be considered. To be approved as eligible for any type of Australian government-subsidised community or residential aged care service a person must be assessed as having physical, medical, social or psychological needs that require the provision of care. In addition, section 5.5(1)(a) of the *Approval of Care Recipients Principles 1997* states that a person must have "a condition of frailty or disability requiring at least low level continuing personal care" and be "incapable of living in the community without support". There are also other criteria for the different types of care listed in these Principles.

The ACAP ECRG recommends the following assessment tools are used to measure the functional status of a person in all ACAT assessments and a comprehensive review of these instruments is in Attachment 4.

- the Modified Barthel Index (Mahoney and Barthel, 1965 with Collin et al., 1988 scoring) to assess a person's capacity to independently perform self care and mobility activities of daily living; and
- the Older Americans' Resource and Services Schedule - Multidimensional Functional Assessment Questionnaire (OARS-MFAQ) Instrumental Activities of Daily Living (IADL) (OARS-IADL) to assess a person's skills to live independently in a community setting, that are more complex than the basic activities of daily living (i.e. instrumental activities of daily living).

As neither of these instruments is appropriate for the assessment of Indigenous Australians the KICA-ADL (LoGiudice et al., 2006) is recommended to assess Indigenous Australians from rural and remote areas. The KICA ADL also contains some IADL items and is currently being validated. The KICA-Assessment tool, which has also been reviewed with respect to the assessment of cognitive aspects, also includes an ADL assessment and this will be commented on below in the context of this review (refer Attachment 5).

The ACAP ECRG recommends that screening items are used for the following dimensions of assessment of a person's physical function: mobility, falls, pain, nutrition, oral health, skin condition, foot problems, continence, sensory, sleep, environmental and health and lifestyle. An outline of all screening items to be included in the standardised assessment can be found in Attachment 2.

3.1 Recommended Screening Items

3.1.1 Mobility

The assessment of mobility is addressed by the use of the Modified Barthel Index (Collin et al., 1988) which is discussed in Section 3.2 below. Every ACAT assessment will include an assessment using this index. In considering the person's mobility an ACAT assessor will examine the responses to items that refer to transfer, mobility and the use of stairs.

The degree of mobility of a person and the amount of assistance required should be considered to determine the most appropriate living environment, and eligibility for available support services. Additional mobility aspects can be addressed by referral to an Occupational Therapist and to agencies that provide home modifications and the provision of aids for people with disabilities.

Recommendation: The ACAP ECRG considers that sufficient information is provided from the mobility items within the Modified Barthel Index for an ACAT assessor to make recommendations concerning mobility and that the use of a follow up assessment instrument is not required.

3.1.2 Falls

The main item concerning falls is drawn from the ONI-N (Samsa et al., 2008). This item is: *Have you had a fall in the past 6 months (Yes / No / Not Sure)? If 'yes', record the number of falls in past six months.*

The ACAP ECRG considered that the time frame for this question should be 12 months and that it was not necessary to record the number of falls or to have a comments box. Barker et al. (2009) report good predictive validity for a similar falls item using a 12 month timeframe and this is also consistent with the Guideline for the Prevention of Falls in Older Persons (American Geriatrics Society, British Geriatrics Society and American Academy of Orthopaedic Surgeons Panel on Fall Prevention, 2001). The item has been revised accordingly (refer Attachment 2).

Additional items concerning fear of falling were also suggested. These items are from Zijlstra et al. (2007) and were included in a Dutch survey of 4,013 older people selected from the general population of community-living older people. These items concern the fear of falling and the avoidance of activities due to fear of falling. In this survey 53% reported fear of falling and 38% reported avoiding activity due to fear of falling. This study found that age; female gender, a rating of fair or poor perceived health status and 1 or more previous falls were independently associated with fear of falling and the associated avoidance of activities.

The ACAP ECRG recommended that a simple yes/no response category for the fear of falling item was preferable and that an additional item concerning avoidance of activities due to fear of falling was unnecessary.

Given the substantial changes to the response categories of the fear of falling item it would be desirable to assess the psychometric properties of the revised item if a pilot study is undertaken.

The recommended falls screening items are:

*Have you had a fall in the past 12 months (Yes / No)?
If 'yes', a referral for a falls assessment should be considered.*

*Are you afraid of falling (Yes / No)?
If 'yes', a referral for a falls assessment should be considered.*

Recommendation: The ACAP ECRG recommends that the modified falls item from the ONI-N and a modified item from Zijlstra et al. (2007) concerning fear of falling are included in a standardised ACAT assessment.

3.1.3 Balance and Gait

The Balance and Gait single item suggested was from the InterRAI Home Care comprehensive assessment instrument, however for copyright reasons this is unavailable for use. No other single item appropriate to this area was identified. The primary purpose of most balance and gait tests is to predict the likelihood of falls, which has been addressed to some extent by the items concerning falls above.

As is indicated in Section 3.4 the predictive validity of falls risk assessment tools has been questioned (Barker et al., 2009). Similar issues have been raised concerning comprehensive assessments that are used for identifying issues with balance and gait such as the Timed Up and Go Test (TUG) (Lindsey et al., 2004) a modified Get Up and Go Test. Nordin et al. (2008) also reported that staff global judgements concerning falls risk and a history of previous falls were superior to the performance based measures such as the TUG in predicting falls. Cattaneo et al. (2006), in a study with multiple sclerosis patients, also found the Berg Balance Scale, TUG, the Hauser Deambulation Index, the Dynamic Gait Index, the Dizziness Handicap inventory and the

Activities-specific Balance Confidence, all had poor performance in discriminating between 'fallers' and 'non-fallers'.

Recommendation: The ACAP ECRG does not recommend the inclusion of an additional single item or short performance assessment of balance and gait in the standardised ACAT Assessment.

3.1.4 Pain

The ACAP ECRG suggested a global screening item for pain below: this item is from the RAND 36-Item Short Form Health Survey 1.0 (Hays et al., 1993), which is in the public domain.

How much bodily pain have you had during the last 4 weeks? Tick the appropriate box (None / Very Mild / Mild / Moderate / Severe / Very severe).

This item is included in the ONI-N assessment tool (Samsa et al., 2008) and has been drawn from the Rand Medical Outcomes Study (Stewart et al., 1992), and is also included in the well-validated Short Form-36 Scales (Hays et al., 1993; Ware et al., 1993). It has also been included in the ACT Continuum of Care and Health Outcomes Study and has been found to be sensitive to the differences between patients receiving medical and surgical treatments (Shadbolt et al., 1996; 1997).

There was some discussion by ACAP ECRG as to whether this item should be modified to remove the word 'bodily'. The original wording is a well validated item and the use of the term 'bodily' makes it clear that the item refers to physical pain rather than mental pain or anguish. The ACAP ECRG considered that the phrase 'bodily pain' is not a common expression that is used with this client group in Australia when pain is discussed and it was suggested that the item be modified to:

In the past four weeks have you had more than mild pain or discomfort (Yes / No)?

If 'yes' an assessor could consider undertaking a follow up assessment using a recommended pain assessment tool including the Abbey Pain Scale (for people unable to express their pain), the Brief Pain Inventory-Short or the Residents Verbal Brief Pain Inventory, and then consider referral to a General Practitioner for diagnosis and treatment.

It should be noted that this item has been substantially modified from the validated RAND SF-36 item on which it is based. As it is considered preferable to use validated items wherever possible, if a pilot study is undertaken, the psychometric properties of this modified item should be ascertained.

Recommendation: The ACAP ECRG recommends that the modified screening item on pain is included in the standardised ACAT assessment. For clients needing further assessment of pain, the recommended follow up instruments are discussed in Section 3.4 and include the Brief Pain Inventory-Short, Resident's Verbal Brief Pain Inventory, and the Abbey Pain Scale.

3.1.5 Feeding and Swallowing

The ACAP ECRG examined two screening items for swallowing based on the ONI-N:

*Do you have problems swallowing (Yes / No)?
If 'yes', have you seen a health professional about this?*

The ACAP ECRG suggested the following minor changes:

*Do you have problems swallowing (Yes / No)?
If 'yes', consider referral to a General Practitioner.*

The following items concerning feeding and drinking are already contained in the Aged Care Client Record:

Can the client:

Eat (Independently / Assisted [needs some assistance] / Dependent [unable to manage])

Drink (Independently / Assisted [needs some assistance] / Dependent [unable to manage])

The information gathered from the ADL assessment using the Modified Barthel Index will be used to answer these questions.

Recommendation: The ACAP ECRG recommends the initial screening item on swallowing from the ONI-N, (with a minor modification), is included in the standardised ACAT assessment. The existing items concerning eating and drinking in the ACCR are considered adequate and the ADL assessments undertaken can also help to answer these items.

3.1.6 Nutrition

Concerning nutritional issues, two questions similar to items from the Mini Nutritional Assessment-Short Form (MNA-S) (Rubenstein et al., 2001) were considered by ACAP ECRG as well as a more comprehensive checklist item derived from the draft Aged Care Assessment Service Common Assessment Form (ACAS-CAF). It should be noted that the MNA-S is copyright to Société des Produits Nestlé.

Following consideration of the various options the ACAP ECRG recommended the following items. The first item is asked of the client and the other item is assessor rated.

Have you lost any weight without trying, or had any other nutritional concerns, in the past three months (Yes / No)?

Assessor Rated: Has the client had any nutritional concerns over the past three months (e.g. loss of appetite, reduced food or fluid intake, obviously underweight / overweight, unintentional weight loss/gain, special diet (Yes – [specify concern] / No / Don't Know)?

If 'yes' consider referral for further health assessment.

Recommendation: The ACAP ECRG recommends two screening items concerning nutrition (one assessor rated and the other client rated) are included in the standardised ACAT assessment.

3.1.7 Dental or Oral Health

The ACAP ECRG considered the South Australian Oral Health Referral Pad Questions which form the basis for referral for a dental check up in South Australia. These items are:

1. *Do you have any of your own teeth?*
2. *Have you pain in your mouth while chewing?*
3. *Have you lost any fillings, or do you need a dental visit for any other reason?*
4. *Have you avoided laughing or smiling because of problems with your teeth, mouth or dentures?*
5. *Have you had to interrupt meals because of problems with your teeth, mouth or dentures?*
6. *Have you had difficulty relaxing because of problems with your teeth, mouth or dentures?*

All questions are answered yes, no or don't know and the scoring involves a priority rating system for dental referral.

The ACAP ECRG consider the use of four of these items (excluding items 1 and 4) may be more useful as a follow-up assessment rather than for initial screening. This instrument is discussed further in Section 3.4.3.

An alternative item was identified following consideration of the Oral Health Assessment Tool (OHAT) although it is noted this is a rather detailed item:

Assessor rated: *Does the client have any oral health or dental issues (e.g. problems with denture or natural teeth, dry mouth, problems in chewing or dental pain (Yes / No)?*

If 'Yes,' tick any that apply below:

- a. Has broken or ill fitting dentures; wears only 1-2 hours per day
- b. Has broken, fragmented, decayed, loose or missing natural teeth
- c. Client reports dental pain
- d. Client reports lost fillings or reports the need for a dental visit
- e. Client reports difficulty chewing.
- f. Client reports a dry mouth/ inadequate saliva
- g. Other problems (e.g. gum problems-please specify) _____

From an examination of various instruments, items and forms the following screening items were also identified:

Have you had a dental check up in the last year (Yes / No)?

Do you have any problems with your teeth, mouth or dentures (Yes / No)?

The ACAP ECRG did not consider the proposed dental check up item necessary but agreed to the oral/dental problems item above with minor modification:

Do you have any problems with your teeth, mouth or dentures (Yes / No)?

If 'yes' consider a further assessment using four items from the South Australian Oral Health Referral Pad and consider referral to a dental practitioner.

Recommendation: The ACAP ECRG recommends a single screening item concerning oral and dental health problems. A follow up assessment using the four items from the SA Oral Health Referral Pad is also recommended for people that identify oral health or dental concerns. The possibility of a further follow up assessment using the Oral Health Assessment Tool for clients in rural and remote locations is discussed in Section 3.4.

3.1.8 Skin Condition

The proposed item is a major modification and simplification of four skin assessment items contained in InterRAI HC.

Do you currently have any major skin condition (Yes / No)?

If 'yes' specify below:

- a. Pressure ulcer
- b. Other skin ulcer
- c. Healing surgical wounds
- d. Other skin tears, cuts or lesions
- e. Other skin problems e.g. bruises, rashes, itching, eczema, etc.

If any items are recorded and require treatment consider referral to a General Practitioner.

If a client has major issues with their skin they may require clinical nursing services to assist with wound management. Bandages, dressings and skin emollients to maintain skin integrity are available in some community aged care services, for example an Extended Aged Care at Home (EACH) package. If a client is identified as having skin problems and the problem is not being appropriately managed a referral for further health assessment should be considered.

Recommendation: The ACAP ECRG recommends a single screening item for skin condition is included in the standardised ACAT assessment

3.1.9 Foot Condition

The ACAP ECRG considered a modified ONI-N item, as below:

Do you have problems with one or both feet (Yes / No)?

An additional follow up item for those indicating they have foot problems in the question above is:

Do your foot problems affect your ability to walk or move about (Yes / No)?

If 'yes', the assessor can insert a comment in a box provided below the question.

The ACAP ECRG considered the second item was the only one required and it did not require a comments box. The modified item is:

Do you have a foot problem that affects your ability to walk or move about (Yes / No)?

If 'yes', consider referral to a relevant health professional.

If a client identifies a foot problem, and particularly if this problem affects their mobility, a referral to a relevant health professional should be considered. The responses to the falls items should also be examined with respect to this item and these responses might suggest that a referral for falls assessment may be warranted.

Recommendation: The ACAP ECRG recommends a single screening item to identify foot problems, as modified from the ONI-N, is included in the standardised ACAT assessment.

3.1.10 Sensory Conditions (Vision)

The ACAP ECRG initially considered the vision and hearing items from the InterRAI HC but permission to use these items was not granted. The Vision 2020 Australia ACAT Working Group, a group of clinical experts which had been formed by Vision 2020 to inform the ACAP ECRG process, recommended three other screening items, as follows:

1. *Have you had your eyes tested in the past two years (Yes / No)?*

If no, please refer to an eye health professional

2. *Do you have difficulty with vision, even with glasses (Yes / No)?*

If yes, please refer to an eye health professional

3. *Do you have difficulties carrying out your daily activities due to poor vision (Yes / No)?*

If yes, please refer to an eye health professional

The ACAP ECRG considered that only the second Vision 2020 item was necessary for inclusion in the standardised ACAT assessment and that people who are identified as having vision problems should be referred to an eye health professional.

Recommendation: The ACAP ECRG recommends that the difficulty with vision item suggested by the Vision 2020 Australia ACAT Working Group is included in the standardised ACAT assessment.

3.1.11 Sensory Conditions (Hearing)

The ACAP ECRG considered a hearing difficulty and a hearing check up item from the ONI-N. However, they did not think the hearing check up item was necessary and suggested a simplified single screening item to identify hearing difficulties:

*Do you have difficulty with hearing, even if you use a hearing aid (Yes / No)?
If 'yes', consider referral to a relevant health professional.*

Recommendation: The ACAP ECRG recommends a single screening item to assess hearing difficulty should be included in the standardised ACAT assessment.

3.1.12 Continence

The ACAP ECRG considered that the bowel and bladder control items contained in the Modified Barthel Index – Collin and Wade scoring (Collin et al., 1988) would be sufficient as screening items for continence when supplemented with an item concerning constipation.

The suggested item was:

How often do you experience constipation (e.g. not having a bowel motion over a three day period)? The response options included 'never', 'sometimes' and 'frequently'.

There was concern that the item did not address a broader range of bowel problems including the difficulty passing stool associated with constipation. Consequently, the suggested item was expanded to:

*Do you have any other bowel or bladder problems (e.g. constipation, pain/difficulty in passing stool, increased need to urinate at night, abnormal bowel pattern, frequent diarrhoea or frequent urination (Yes / No)?
If 'yes' consider assessment using the Revised Urinary Incontinence Scale or the Revised Faecal Incontinence Scale and referral to a continence assessment service.*

It is suggested that people scoring 0 or 1 on the Modified Barthel bowels item receive a follow up assessment using the Revised Faecal Incontinence Scale (5 items; Sansoni et al., 2006). It is suggested that people scoring 0 or 1 on the bladder item receive a follow up assessment using the Revised Urinary Incontinence Scale (5 items; Sansoni et al., 2006). A brief overview of these scales is provided in Section 3.4.

Recommendation: The ACAP ECRG recommends that the bowel and bladder items from the Modified Barthel Index are sufficient as an initial screen for a person's incontinence when supplemented with an additional screening item on other bowel or bladder problems. This item should be included in the standardised ACAT assessment.

The recommended follow-up assessment instruments (Revised Urinary Incontinence Scale, Revised Faecal Incontinence Scale) could be used when the initial screening items indicate that urinary or faecal incontinence may be an issue for the person.

3.1.13 Sleep

Following consideration of a number of tools and the Aged Care Client Record, the ACAP ECRG considered the following sleep items:

Do you experience any difficulties with your sleep at night (e.g. difficulty falling asleep, fragmented sleep, getting insufficient sleep: Never / Occasionally / Regularly / Always)?

How many hours do you sleep in a full day of 24 hours (include sleep at night and daytime naps)?

6-9 hours per day	<input type="checkbox"/>
5 or fewer hours per day	<input type="checkbox"/>
10 or more hours per day	<input type="checkbox"/>

The ACAP ECRG considered the inclusion of the second item to be unnecessary, and the first item has been slightly modified:

Do you experience any difficulties with your sleep at night (e.g. difficulty falling asleep, fragmented sleep, getting insufficient sleep; Yes / No)?

If 'yes' consider referral to a General Practitioner.

Recommendation: The ACAP ECRG recommends a single screening item concerning sleep is included in the standardised ACAT assessment.

3.1.14 Environmental Assessment

The ACAP ECRG suggested developing an item based on the ACAS CAF and the InterRAI HC items. The latter item contains a checklist concerning environmental hazards, for example inadequate heating or cooling. It was considered that some of these elements may impinge on duty of care considerations for the ACAT assessor.

Residential Environment

Is the residential environment safe and free of safety hazards and health risks? (Assessor to consider environmental aspects that may impede the person's capacity to complete personal care activities, or may impede access or present a falls risk; Yes / No / Unknown / Not Applicable.)

The ACAP ECRG has suggested a simpler, assessor rated item for use in a community setting:

Assessor rated: Does the residential environment have any major safety and health risks (Yes / No / Don't Know)?

If 'yes' consider referral to an Occupational Therapist.

If the residential environment has minor safety concerns then referral to a relevant health professional concerned with house modification and appliances and aids for people with disabilities might be considered. If the environmental hazards are considered major this may also reflect on the issue as to whether this is the most appropriate residential accommodation for the person.

Recommendation: The ACAP ECRG recommends a single screening item concerning the residential environment is included in the standardised ACAT assessment.

3.1.15 Lifestyle and Health Behaviour Factors

The ACAP ECRG considered items on smoking, drinking, gambling and preventive health activities. These items are routinely included in both comprehensive and screening assessments in the aged care sector (e.g. ONI-N, InterRAI HC etc.). In those contexts the purpose of the questions is to identify those people who may require referral to relevant community programs such as Quit Smoking Programs or a relevant health professional.

Such preventative health roles, however, may be viewed as being beyond the role of ACAT assessors or not entirely relevant to determine eligibility for aged care services. Following discussion of this issue the ACAP ECRG agreed that some lifestyle items should be included to assist an ACAT assessor to make appropriate referrals and assist a person to understand any lifestyle limitations that they may encounter in a residential aged care setting.

The suggested smoking and alcohol items were drawn from a number of scales.

Smoking (modified from ONI-N)

Never smoked

Has quit smoking

Currently smokes less than 10 cigarettes per day

Currently smokes 10-20 cigarettes per day
 Currently smokes more than 20 cigarettes per day

The ACAP ECRG suggested a less detailed question to assess smoking:

*Are you a current smoker (Yes / No)?
 If 'yes' consider referral to a Quit Smoking program.*

A referral to a Quit Smoking Program or General Practitioner should be considered for all smokers.

Recommendation: The ACAP ECRG recommends that single screening item about smoking should be included in the standardised ACAT assessment.

Alcohol

The ACAP ECRG considered a number of items from the ONI-N concerning alcohol consumption, for example: how often and how much alcohol is consumed per day /week or on one occasion. Modifications were suggested for some of these items to reflect the New National Guidelines for Alcohol Consumption (NHMRC, 2010) which recommend the consumption of no more than 4 drinks on one occasion. Previous guidelines (NHMRC, 2001) had also recommended one or two alcohol free days per week for men and women.

The ACAP ECRG suggested a less detailed question to establish whether alcohol consumption caused a problem for a client. The following assessor rated item would be based on information from an informant. If alcohol consumption was identified as a problem a more detailed examination of their alcohol consumption could be addressed by the use of a follow-up assessment scale.

Assessor Rated: Is alcohol consumption causing a problem for this person (Yes / No)?

If 'yes' tick those issues that may apply below

- Difficulties with mobility*
- Confused at times*
- Inappropriate behaviour*
- Personal neglect*
- Dangerous driving*
- Nutritional concerns*

If problems are identified an assessor could consider further assessment using the Alcohol Use Disorder Identification Test (AUDIT) (Saunders et al., 1993), however, the AUDIT was not reviewed as part of this project.

If problems with alcohol consumption are identified, a client should be referred to a health professional or medical practitioner or a relevant counselling service, for example a Drug and Alcohol Service.

Recommendation: The ACAP ECRG recommends that single screening items about alcohol use should be included in the standardised ACAT assessment. If a client has alcohol problems an assessor could consider a follow up assessment using the AUDIT Scale (refer Section 3.4).

Other Drugs and Gambling

The ACAP ECRG also considered the inclusion of an item on 'other drugs' (never/quit/current) as included in the draft ACAS-CAF. Presumably this is asking about use of other illegal/non prescription drugs but it is unclear. While it may identify a very small percentage of clients who use 'other drugs' the amount of use is not identified in the response options. Given these factors the ACAP ECRG did not recommend this item for inclusion. In addition, a gambling item was not recommended.

Recommendation: The ACAP ECRG does not recommend that items concerning the use of other drugs and gambling are included in the standardised ACAT assessment.

3.1.16 Immunisation/Vaccinations

The ACAP ECRG initially considered the ONI-N item on immunisation status. As this area of assessment is also concerned with health prevention aspects, but does not have any bearing on eligibility for aged care services, obtaining information concerning this aspect may be viewed as beyond an ACAT assessor's role. Following further consideration the ACAP ECRG decided not to include an item on immunisation in the standardised ACAT assessment.

Recommendation: The ACAP ECRG recommends that an item on immunisation status should not be included in the standardised assessment.

3.1.17 Self Rated Health Status

This item was recommended by the ACAP ECRG as it is known as a good predictor of mortality/period of survival and it is highly related to health morbidity.

Both the ONI-N and the InterRAI contain the self-rated health item from the SF-36 (Versions 1 and 2). It is noted, however, that this item derives from the Rand Medical Outcomes Study Patient Assessment Questionnaire (Stewart, Sherbourne et al., 1992) which is in the public domain and the authors of the SF-36 indicate this particular item was widely used even before this time (Ware et al., 1993). The item is:

In general would you say your health is... (Excellent / Very Good / Good / Fair / Poor)?

There are Australian norms for this item (ABS, 1997; Hawthorne, 2006). It is included in the General Health Profile of the SF-36 and has a correlation of 0.63 with the General Health Scale (Version 1) and 0.7 with the recalibrated scoring used for Version 2 (see below).

The General Health Scale or General Health Rating Index summary score correlates appropriately with other health measures. It can differentiate the impact of serious and minor acute symptoms, is a good predictor of medical care expenditures and return to work after a heart attack, and has proved useful in detecting health outcomes in the Rand Health Insurance Experiment (Ware et al., 1993).

McDowell (2006) and McCallum et al. (1994) note that numerous longitudinal studies have confirmed very strong associations between scores on this item and mortality, even after controlling for a range of risk factors. Odds ratios for mortality typically ranged from 2-4 for those who reported being in poor health. Self rated health also predicted hospital admissions over the next 4 years (McDowell, 2006).

Ware et al. (2001) report that scaling analyses have shown non-linearities in the response scale with the interval between 'Excellent' and 'Very Good' is about half that between 'Good' and 'Fair' and suggests that 'Excellent' be scored 5; 'Very Good' as 4.4; 'Good' as 3.4; 'Fair' as 2.0 and 'Poor' as 1. This issue could be addressed in the scoring of the item.

A later version of this item is included in the SF-8 where an additional response category of 'Very Poor' has been added (Ware et al., 2001b). However, it is thought copyright restrictions are more likely to apply to this modified item. It is recommended the original item is included in the standardised ACAT assessment.

This item has a strong association with morbidity and is a predictor of mortality/period of survival. It reflects the individual's own rating of their health status. A score of fair or poor on this item can inform the ACAT assessor that the person may have substantial health risks/concerns. It may also

indicate to the assessor the potential for poor health outcomes and a more complex or lengthy assessment.

Recommendation: The ACAP ECRG recommends the inclusion of a single screening item from the RAND MOS PAQ (Stewart et al., 1992) and RAND SF-36 Health Survey (Hays et al., 1993) for self rated health status. The ACAP ECRG also considered it would be appropriate to ask this question immediately prior to the questions in the ACCR concerning diagnosed disease or disorders.

3.2 Other Potential Screening Items: Physical Function

ACAP ECRG requested that any potential gaps in the proposed assessment should be identified.

3.2.1 Asthma and Respiratory Conditions

It has been reported that asthma and its associated symptoms are under-diagnosed and under-treated in those over 65 years in Australia (CHSD, 2010; Asthma Management Program Evaluation) and it was identified that some comprehensive assessment tools include items on breathlessness, asthma and respiratory conditions (e.g. InterRAI HC). For these reasons, the ACAP ECRG considered some screening items for asthma and associated conditions; however, they agreed that the impact of these conditions would be detected at more general levels of physical functioning.

Recommendation: The ACAP ECRG does not recommend including any items concerning asthma or breathlessness in the Standardised ACAT Assessment.

3.2.2 Other Possible Items

As the ACAP ECRG requested that any potential gaps in the proposed assessment should be identified a few areas which are included in other comprehensive assessment instruments were identified for consideration by the ACAP ECRG. These areas concerned fatigue and more detailed items concerning the use of aids and appliances, and whether the client has a long term disability, than is contained within the ACCR. The ACAP ECRG considered these items but did not recommend their inclusion.

Recommendation: The ACAP ECRG does not recommend the inclusion of additional items to address these aspects.

3.3 Reviewed Core Assessment Instruments: Physical Function

The ACAP ECRG recommends that every person receives an assessment of their functional capacity. The recommended instruments for the assessment of physical function (ADL and IADL components) are:

- Modified Barthel Index with Collin scoring (Collin and Wade, 1988)
- KICA-ADL (Smith et al., 2009; Stevenson et al., 2008): ADL and IADL assessment for Indigenous people living in rural or remote areas
- OARS-IADL for the assessment of Instrumental Activities of Daily Living (Fillenbaum and Smyer, 1981)

The comprehensive reviews of all physical function instruments are at Attachment 4 and a description of each instrument is provided in Sections 3.3.1 - 3.3.3. A summary of the comparative ratings for these instruments are in Table 1 below. Each rater scored the instruments separately and then a consensus was reached. All instruments demonstrate adequate reliability and validity.

Table 1 Summary of Ratings for Functional Assessment Instruments

Criteria	Weight	Barthel-ADL	KICA-ADL ^a	OARS-IADL	Lawton & Brody IADL
Theoretical/empirical basis	3	3	3	3	3
Availability of comparison data	3	2	2	3	2
Length/feasibility of instrument for inclusion in battery	2	3	3	3	3
Complexity of administration/cognitive burden	2	3	3	3	3
Cultural Appropriateness	1	2	3	2	2
Ease of obtaining score	2	3	3	3	3
Sensitivity	3	2	2	2	2
Reliability evidence	3	3	1	3	3
Validity evidence	3	3	1	3	2
Cost of the instrument	2	3	3	3	3
Cost of instrument administration	2	2	2	2	2
Weighted Total		69	58	72	66

a. This is a new instrument currently undergoing validation

3.3.1 Modified Barthel Index

For the assessment of the Activities of Daily Living (ADL) the Barthel Index was recommended by the ACAP ECRG. The version of the Barthel which was selected for review was the Modified Barthel Index with Collin scoring (Collin and Wade, 1988). There are a number of other modified versions of the Barthel including the Shah et al. (1989) version but McDowell (2006) recommends the version with Collin scoring.

The recommended modification of the Barthel Index using Collin et al. (1988) scoring (20-point) was reviewed. The scoring has been improved from the original Barthel Index (Mahoney and Barthel, 1965) and it is easier to use than some of the other modified versions. A copy of the instrument is at Attachment 3 and a review of the instrument can be found in Attachment 4.

The draft Aged Care Assessment Service Common Assessment Form (ACAS CAF) includes a modification of the Shah et al. (1989) version of the Modified Barthel Index which has a 5 level item scoring system associated with descriptors of what these scores mean for each item. The Shah version is a somewhat more complex instrument to score and the original descriptors associated with the score levels are more open to interpretation; for these reasons this version was not recommended. It should be noted that the version included in the draft ACAS CAF is actually a further modification of the Shah version with different descriptors for the item score levels and no evidence for the validation of this later modification of the Shah version could be found.

The Barthel Index is a “classic instrument in ADL assessment” (Pearson, 2004) and “represents probably the oldest and most widely used scale to assess physical disability in elderly patients in general” (Burns et al., 2004). Bowling (2001) reports the scale is also extremely popular among neurologists (Bowling, 2001). Pearson (2004) notes that for care planning purposes or treatment purposes, the individual tasks scores are often more useful in identifying patient needs than is the total score.

The Barthel Index is a clinical rating scale and contains 10 ADL items looking at personal care or self-care and mobility. The items cover feeding, mobility from bed to wheelchair, personal toilet - washing, getting on and off toilet, bathing, walking on a level surface - propel wheelchair, going up and down stairs, dressing, bowel and bladder incontinence. The modification of the 10 item version uses a 20 point scoring system. Scores range from 0 to 2 or 3 for each activity and a score less than 4 indicates total dependence and scores less than 12 indicate dependence (Gupta, 2008).

The modified 20-point Barthel Index has been found to be valid and reliable in patients following a stroke (Kalra and Crome, 1993) and other clinical groups (Pearson, 2004), and Gupta (2008) also notes that changes in the scale correlate well with physician assessment of progress. Generally, the inter-rater reliability has been found to be good (McDowell, 2006; Pearson, 2004). However, Sainsbury et al. (2005) recommend the instrument, but reported the inter-rater reliability of the 20-point BI has been found to be 'fair' to 'moderate' when used with older people. The 20-point BI has been widely used in hospital settings, with the elderly and with frail patients and those with chronic and disabling conditions (Gupta, 2008). It is also routinely used in assessing young adults with disabilities in the transition from school to post school programs (Eagar et al., 2006; 2010)

Criticisms of the Modified Barthel Index include: that changes in function can occur beyond the scale's end-points (Bowling, 2001, 2005); that it is narrow in range and misses low levels of disability (McDowell, 2006); and that it measures what a patient actually does rather than what they can do based on their ability (Bowling, 2001). Further information is required requiring its inter-rater and test-retest reliability and application in Australia, especially in relation to the effects of training and user guides. Clinical reference norms are also required for age, sex and medical condition (McDowell, 2006). This would assist with outcomes interpretation and determine any floor and ceiling effects.

In summary, the Modified Barthel Index is simple to use and a popular measure of ADL functioning (self-care and mobility), especially for elderly people with neurological conditions. However, the index needs to be supplemented by items examining using instrumental activities of daily living (IADLs), for example cooking and cleaning, in community settings (Bowling, 2001).

Despite some of the limitations identified above, the 20-point Modified Barthel Index has been assessed as having adequate validity and reliability and there is some evidence concerning sensitivity to change. It is an easy instrument to use and score.

Recommendation: The ACAP ECRG recommends the Modified Barthel Index (Collin et al., 1988) is included for the assessment of ADL function in the standardised ACAT assessment.

3.3.2 KICA-ADL

The Kimberley Indigenous Cognitive Assessment (KICA) was developed in response to the need for a validated cognitive screening tool for older Indigenous Australians living in rural and remote areas (<http://www.wacha.org.au/kica.html>). The KICA-ADL is the daily living skills (ADL and IADL) section of the KICA. It is an informant questionnaire given by the interviewer. It has not been validated; however, it shows excellent internal consistency and can be used to assist a medical practitioner in determining the diagnosis and level of dementia, and health and community workers in determining the level of required support services. It is recommended that the other KICA components are conducted in addition to the KICA-ADL for information on cognitive status, and possible co-morbid conditions and differential diagnoses. A copy of the KICA-ADL is at Attachment 3.

Recommendation: The ACAP ECRG recommends the KICA-ADL is included in the standardised ACAT assessment for the assessment of ADL and IADL function of Indigenous Australians from rural and remote areas.

3.3.3 OARS-IADL

The Older Americans Resources and Services - Instrumental Activities of Daily Living Scale (OARS-IADL) is the preferred modification of the Lawton and Brody IADL scale. "...it is an advance on the Lawton and Brody IADL scale with improved psychometric properties and less reliance on gender role stereotypes; and it has been adapted for use in primary and community care settings in Australia" (see Green et al., 2006) and Sansoni et al. (2008).

The OARS-IADL scale by Fillenbaum (1985) is an adaptation of the original Lawton and Brody IADL instrument (see Pearson, 2004). It contains seven items: telephone, transportation, shopping, meal preparation, housework, medication management, money management. Each item has a core three point response format: without help, with help or unable. For the OARS-ADL scale, each is scored on a three point (0, 1 or 2) response scale. The score range is from 0 (dependent) to 14 (independent). Higher total scores reflect greater independence (Eagar et al., 2001). A copy of the OARS-IADL items is at Attachment 3.

The OARS-IADL is a clinical rating scale based on direct or proxy observation (though self-report versions are available). It is recommended for use with older people living in the community (Pearson, 2004) and takes about five minutes to administer (Burns et al., 2004). The OARS-IADL scale is part of the Older Americans' Resource and Services Schedule / Multidimensional Functional Assessment Questionnaire (OARS-OMFAQ or OARS).

A modified and shorter Australian version of the OARS-IADL is included in the Home and Community Care Program MDS for use as a functional screen in community care settings in Australia (Eagar, Owen et al., 2006; Green et al., 2006) and it is also routinely used in disability programs in NSW (Eagar, Green et al., 2006; Eagar et al., 2010). It is incorporated in the ONI-N and related assessment systems to identify areas requiring further screening/evaluation and as a simple method of priority rating (Stevermuer et al., 2004; 2007).

Further psychometric information is required for the OARS-IADL, particularly in Australian settings, on test-retest reliability, discriminative validity for different clinical groups, responsiveness to change and testing in CALD and Indigenous communities. McDowell (2006) also outlines the need for more data from large samples. McDowell (2006) also argues that we need more information about the use of the scales with cognitively impaired subjects and the response that category "performs the task without help"; they may be able to do the tasks but more slowly and less efficiently than others.

The OARS-IADL is a well validated IADL instrument with adequate reliability to use for the assessment and screening for care needs in older adults (Pearson, 2004).

Recommendation: The ACAP ECRG recommends the OARS-IADL is included for the assessment of IADL function in the standardised ACAT assessment.

3.4 *Suggested Follow-up Instruments: Physical Function*

3.4.1 Falls

The ACAP ECRG considered a short version of the Peninsula Health Falls Risk Assessment Tool (PHFRAT, 1999) as a follow up tool to assess falls. Part 1 of the PHFRAT (Falls Risk Status) can be used as a screening assessment; Part 2 is a Risk Factor Checklist and includes a range of risk factors and a more complete history of falls and Part 3 is an Action Plan.

The Fall Risk Status component includes medicine use, psychological symptoms, and cognitive status as assessed by the Abbreviated Mental Test Score (AMTS) as well as a brief history of recent falls. A maximum score of 20 can be derived – a maximum of 8 points assigned to falls and

4 points each are assigned to the other 3 components. The rationale for the system of score weights may require further psychometric evaluation (Barker et al., 2009).

The Risk Factor Checklist includes rating items concerning Vision, Mobility, Transfers, Behaviours, Activities of Daily Living, Environment, Nutrition and Continence. As all of these factors are to be included in the standardised ACAT assessment it would seem unnecessary to ask these questions again in a follow up assessment. However, it is also noted that PHFRAT uses the Abbreviated Mental Test Score (AMTS) to assess cognition rather than the Standardised Mini Mental State Examination recommended by the ACAP ECRG.

More importantly, a recent paper by Barker et al. (2009) has examined the psychometric properties of four fall risk assessment tools for use in Residential Aged Care in Australia. These tools were the PHFRAT, The Falls Assessment Risk and Management Tool (FARAM), the Queensland Falls Risk Assessment Tool (QFRAT) and the Melbourne Fall Risk Assessment Tool. The predictive validity of all 4 tools was found to be low and no better than using a single item screening question 'Has the resident fallen in the past 12 months?'

Statistical analysis indicated the tools were not uni-dimensional but multi-dimensional (Rasch Analysis) and thus summing items to yield an overall measure of fall risk is not valid. More than 40% of the items on each tool were found not to be predictive of falls and it was also noted that poor inter-rater agreement was found with many of the items (50%) on the tools. These findings raised several concerns about the use of falls risk assessment tools in residential aged care and the poor measurement properties of these tools raises similar concerns for their use in community care settings.

Scott et al. (2007) conducted a systematic review of published studies that tested the validity and reliability of fall risk assessment tools. Thirty-eight tools met the inclusion criteria but only 6 tools showed moderate to good reliability and few tools were tested in one or more settings (community, home support, long term and acute care settings).

If a follow up tool is desired then a more thorough comparative examination of the tools identified as having moderate to good reliability by Scott et al. (2007) and promising tools developed since that time may be required. A new tool, the Falls Efficacy Scale International (FES-I) and its short version FES-I abbreviated (Kempen et al., 2008; Ruggiero et al., 2009) should be considered if such a review is undertaken although it is noted the focus of these tools is on fear of falling. The screening items recommended for falls assessment already include an item concerning fear of falling.

Recommendation: The ACAP ECRG recommends that none of the Falls Risk Assessment tools discussed are included as a follow up in the standardised ACAT assessment, but that a person should be referred to a falls clinic or relevant health professional for further assessment if required.

3.4.2 Pain

For the assessment of pain of elderly people the Australian Pain Society (2005) has suggested: the Brief Pain Inventory (Cleeland, 1991) for broader community use; and the Resident's Verbal Brief Pain Inventory for those living in residential aged care homes.

The Brief Pain Inventory (BPI) is a multi-dimensional pain assessment tool which examines both pain severity, the site(s) of pain and its impact on aspects of the client's life (e.g. sleep, mood, activity etc.). There are short and long versions of this instrument. It is the BPI (Short) that is recommended for ACAT follow-up assessment. The BPI has been used to assess the global impact of pain in older community populations although the original instrument has not been validated in Residential Care Facilities (Herr and Garland, 2001; Australian Pain Society, 2005). The BPI has been fully validated in 17 languages and thus may also be useful for use with clients from culturally and linguistically diverse backgrounds.

The Resident's Verbal Brief Pain Inventory is a modification of the Brief Pain Inventory for communicative clients in residential care facilities. It considers the evidence that most residents with moderate degrees of cognitive impairment prefer verbal descriptors of pain intensity rather than numeric rating scales such as the 0 – 10 visual analogue scales that are contained in the BPI (Ferrell et al., 1995) Thus the RVBPI uses verbal descriptors. An Australian pilot study in both high and low level care facilities suggests this instrument is useful, reliable and valid for this population (Gibson et al., 2004). It may also be appropriate to use this instrument in community care settings when a moderate degree of cognitive impairment is suspected.

The Abbey Pain Tool (Abbey et al., 2004) is also recommended by the Australian Pain Society (2005) only for persons with dementia or for those who are unable to articulate their needs. It is an observational scale. Ratings can be taken while the subject is at rest although the psychometric properties are slightly better when the observations and ratings are made of the client during movement.

The Abbey Pain Scale appears to have good inter-rater reliability (0.76-0.82) and moderate test retest reliability (0.66). The Cronbach's alpha (Internal consistency) was 0.65 in the Japanese modification and 0.59 pre-intervention and 0.74 post-intervention in an Australian sample. These figures for internal consistency would be regarded as marginal to adequate (Streiner and Norman, 2006). An analysis of the item total correlations and the Cronbach's alpha as each item is progressively removed, would seem warranted as it may give a clear indication as to any item that may require modification.

The Australian Pain Society also recommends an informant version of the BPI (Informant-BPI). However, the informant version had low correlations with the other self-report and observer rated pain scales.

Recommendation: The ACAP ECRG recommends the inclusion of the Brief Pain Inventory (Short), the Resident's Verbal Brief Pain Inventory and the Abbey Pain Scale as follow up tools for the assessment of pain in the standardised ACAT assessment.

3.4.3 Oral and Dental Health

The South Australian Oral Health Referral Pad

The South Australian Oral Health Referral Pad (SA OHRP) contains questions which form the basis for referral for a dental check up in South Australia. The ACAP ECRG considers four of these items useful for follow-up assessment (see Section 3.1.7). The six items in the scale are:

1. Do you have any of your own teeth?
2. Have you pain in your mouth while chewing?
3. Have you lost any fillings, or do you need a dental visit for any other reason?
4. Have you avoided laughing or smiling because of problems with your teeth, mouth or dentures?
5. Have you had to interrupt meals because of problems with your teeth, mouth or dentures?
6. Have you had difficulty relaxing because of problems with your teeth, mouth or dentures?

All questions are answered yes / no / don't know. People are classified as high priority for referral if they answer 'Yes' to Q3 and say 'Yes' to any other item dental impact item (e.g. items 2, 4, 5, and 6). People are classified as moderate priority if they answer 'Yes' to Q.3 or any other dental impact item. Slade (2007) indicates this is a useful screening tool, it is quick and easy to use and it can be used by any health professional with a minimum of training as contrasted with other tools such as the OHAT (Chalmers et al., 2005) which require an oral examination.

As Q.1 is not used in the scoring or risk classification system it is unclear why this question is asked. Slade (2007) also indicates Q4 has an endorsement rate of only 2% which might suggest this item could be deleted. It is suggested that this scale could be reduced to four items,

recognising that further data analysis could examine the internal consistency reliability of the instrument as each item is removed.

Permission could be sought from the instrument authors for the use of these four items. Scoring of the instrument will not be affected by using only 4 items. In this case the people would be classified as high priority for referral to a dentist if they answer 'Yes' to Q.3 and say 'Yes' to any other item dental impact item (e.g. items 2, 5 and 6). People are classified as moderate priority if they answer 'Yes' to Q.3 or any other dental impact item.

Recommendation: The ACAP ECRG recommends the inclusion of the four items from the SA OHRP as a follow up tool for the assessment of dental issues in the standardised ACAT assessment.

The Oral Health Assessment Tool

The Oral Health Assessment Tool (OHAT) (Chalmers et al., 2005) is a simplified oral health rating tool that has been modified from the Brief Oral Health Status Examination (BOHSE). Feedback from initial use by residential care staff indicated the BOHSE was too complicated and it took too long to complete. This simplification was designed to make it more usable by the range of residential care staff (including personal care staff) and for rating patients with dementia.

The OHAT has eight rating categories (lips, tongue, gums and tissues, saliva, natural teeth, dentures, oral cleanliness and dental pain) and each item is rated from 0 = healthy, 1 = changes (more minor problems) to 2 = unhealthy. It takes approximately 8 minutes to administer (compared to about 9 minutes for the BOHSE) but staff require training in its use.

The data from the initial validation of this tool indicates it showed promise as a reliable (inter-carer and intra-carer reliability kappa coefficients were reported and were moderate to high depending on the rating category) and valid tool (good correlation with independent dental assessment for most categories) for use in residential care facilities. However, further validation studies are required across a range of settings and further modifications may need to be made to the assessment categories of saliva, oral cleanliness and dental pain.

An ACAT assessor could consider using the OHAT in those rural and remote communities where there may be limited accessibility to a dental practitioner. In most urban areas a referral to a dentist is preferred. The OHAT should only be used by ACAT assessors that have been trained in its use and this assessment is usually undertaken by a nurse.

Recommendation: The ACAP ECRG recommends the inclusion of the OHAT as a follow-up tool for the assessment of dental problems in rural and remote areas, only where there is limited accessibility to a dental practitioner.

3.4.4 Contenance Assessment

The ACAP ECRG recommended that the bowel and bladder control items contained in the Modified Barthel Index – Collin and Wade scoring (Collin et al., 1988) would capture the information required for an initial screen for continence issues in combination with an extra item. Where a problem is identified the suggested follow up tools are the Revised Urinary Incontinence Scale (RUIS; Sansoni et al., 2006; 2009) and the Revised Faecal Incontinence Scale (RFIS; Sansoni et al., 2006; 2009).

A National Continence Management Strategy project *Refining Continence Measurement Tools* (Sansoni et al., 2006) was undertaken to revise and develop some short incontinence assessment tools (5 items). From the analysis of the urinary and faecal incontinence items and scales included in the 2004 SAHOS community survey, this study developed some revised scales for the assessment of urinary and faecal incontinence (Revised Urinary Incontinence Scale [RUIS], Revised Faecal Incontinence Scale [RFIS]). These scales improved the assessment of

incontinence when compared with the original measures (Sansoni et al., 2006). Both the revised scales were found to have excellent internal consistency reliability (RUIS 0.91, RFIS 0.85) in a large community sample (N=3000). Initial validation data from the population survey also indicated these measures correlated as expected with other measures of urinary and faecal incontinence and with measures of health related quality of life.

A pilot study using the RUIS in a clinical sample (Hawthorne, Sansoni et al., 2006) indicated the RUIS could describe more severe cases of incontinence than would be found in a population survey sample and that it was sensitive to change / improvement arising from treatment.

Currently, a study on the *Validation and Clinical translation of the Revised Continence and Patient Satisfaction tools* (Sansoni et al., 2009) is in progress across eleven clinical sites throughout Australia. Initial clinical findings confirm that the RUIS has adequate internal consistency reliability ($\alpha = 0.72$ at pre-test and $\alpha = 0.92$ at post-test) and that it is very sensitive in detecting changes arising from treatment. The RUIS has also been included in the Australian Longitudinal Study of Women's Health and thus further population and longitudinal data will shortly become available.

Initial findings in clinical settings also confirm that the RFIS has good internal consistency reliability ($\alpha = 0.75$) although further data needs to be collected by the study before conclusions can be made concerning sensitivity to change.

Initial data on these continence instruments indicate they have adequate reliability and validity and could be used as follow-up tools as suggested by ACAP-ECRG.

Recommendation: The ACAP ECRG recommends the inclusion of the Revised Urinary Incontinence Scale (RUIS; Sansoni et al., 2006; 2009) and the Revised Faecal Incontinence Scale (RFIS; Sansoni et al., 2006; 2009) as follow up tools for the assessment of continence problems in the standardised ACAT assessment.

3.4.5 Problems with Alcohol Consumption

For clients who may have problems with alcohol consumption a follow-up assessment using the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) could be considered, however, this tool was not reviewed as part of this project. The AUDIT was developed by the World Health Organization as a measure of alcohol consumption, alcohol dependence, and alcohol related problems. Kelly et al. (2002) reported that the AUDIT had better internal consistency than other related measures and it was better able to differentiate between problem and non problem drinkers.

Recommendation: The ACAP ECRG recommends that assessors could consider using the AUDIT as a follow up tool if a client has alcohol problems; however, this tool was not comprehensively reviewed as part of this project.

4 Cognitive Function

Cognitive impairment affects a person's ability to manage their lives independently in the community and is relevant to assess eligibility for appropriate support services. The ACAP ECRG was of the view that a cognitive assessment should be routine for every ACAT client. The review completed for cognitive function focuses on some leading cognitive assessment instruments, for example the Standardised Mini-Mental State Exam and KICA-Cog.

It was thought that the ACCNA-R (subject to its later validation in a field test) or another cognitive screening item should also be considered. The objective would be to identify those people who would clearly not require a cognitive assessment as they are functioning quite normally for their age; and for whom a cognitive assessment may be time consuming and unwarranted.

The following instruments are comprehensively reviewed in this report: the Standardised Mini-Mental State Exam (Molloy et al., 1991); the IQCODE (Jorm, 2004), the KICA-Assessment tool including KICA-Cog Instruments (LoGiudice et al., 2006) and the KICA-Informant (Smith et al., 2009; Stevenson, Smith, and Strivens, 2008).

Some of the recommended instruments such as the RUDAS (Storey et al., 2004) and the MMSE-3MS (Teng and Chui, 1987) have previously been reviewed in the DOMS report (Sansoni et al., 2008) and these extant reviews have been used where appropriate; these instruments have been rescored using the ACAP AHOC evaluation framework used for this project.

4.1 Suggested Screening Items: Cognitive Function

4.1.1 Cognition

The ACAP ECRG suggested that all ACAT clients receive a cognitive assessment using the Standardised Mini-Mental State or other culturally appropriate cognitive assessment where appropriate.

Some consideration was also given to the use of a screening item from the HACC functional screen (Owen et al., 2001) and the ONI-N (Samsa et al., 2007, 2008) in conjunction with responses to some items on the OARS-IADL, noting that the item would need to be evaluated as part of a pilot study. This item would be assessor rated and is:

Does the person have any memory problems or get confused (Yes / No)?

In the ONI-N and the ACCNA this is not the only item that is used to trigger the cognitive assessment. In these instruments a cognitive screen would be undertaken for any client who could not manage their medication or finances without help regardless of whether the person is assessed as also having memory problems or gets confused.

It should also be noted that the OARS-IADL items are ordered hierarchically in that skills relating to the more complex items concerning the management of medicines and money are more likely to be lost earlier. The research literature demonstrates a hierarchical relationship between domestic and self-care tasks, with domestic tasks generally being lost before self-care tasks and this finding was confirmed in the national HACC field trial (Eagar et al., 2002). The literature also indicates that inability to carry out some domestic tasks may be an indicator of cognitive impairment (Cromwell et al., 2003).

Following further discussion the ACAP ECRG did not recommend adopting a screening item for this domain.

Recommendation: The ACAP ECRG recommends that all clients receive a cognitive assessment using the appropriate recommended cognitive assessment instrument.

4.1.2 Decision Making

The ACAP ECRG considered the inclusion of items concerning a person's capacity for decision making note that a person is required to sign the statement of application and consent prior to the commencement of the ACAT assessment. If a person was not competent to make their own decisions, or is unable to sign the form for some other reason, someone else would be required to sign on their behalf.

The ACAP ECRG initially considered using the following assessor rated item from the ACCNA-R (*Is the person capable of making their own decisions; Yes / No / Don't Know?*) might be an issue that is addressed at the beginning of the ACAT assessment rather than during the process of assessment.

A limitation of the proposed question is that it does not reflect how well a person makes decisions. In the InterRAI HC the question concerning decision making is part of the cognitive assessment. The assessor rates the client concerning their capability to make everyday decisions concerning tasks of daily life. The ratings used are independent / modified independence / moderately impaired / severely impaired / unconscious or in coma. It was considered that this issue could be addressed to some extent by a minor modification to the ACCNA item as follows:

Is the person capable of making their own decisions?

- Yes (*appropriate decisions are made; minor difficulty occurs only in new situations*)
- No (*minor impairment/ requires occasional supervision or assistance through to severe impairment*)
- Not sure

In the ACCNA-R the following question is also rated:

Who assists the care recipient in making decisions?

- a. = No one
- b. = Significant Informal Assistance
- c. = Power of Attorney
- d. = Advance Health Directive
- e. = Person responsible or appointed guardian

This item could be rated if the assessor considers the client to be impaired in their capacity to make decisions.

An additional item in the ACCNA-R and ONI instruments which concerns assistance with decision making is:

Who assists the person/care recipient in making financial decisions?

- a. = No one
- b. = Significant Informal Assistance
- c. = Power of Attorney
- d. = Formal financial manager or administrator (ONI) /Advance Health Directive (ACCNA-R)
- e. = Person responsible or appointed guardian

The ACAP ECRG thought these items required some modification and suggested the following decision tree approach:

Assessor Rated: *Are there any concerns regarding the person's decision making capabilities?*

- Yes (*minor impairment/ requires occasional supervision or assistance through to severe impairment*)
- No (*appropriate decisions are made; minor difficulty occurs only in new situations*)
- Don't Know

If 'yes', who assists the client in making health and lifestyle decisions?

- a. No one*
- b. Significant Informal Assistance*
- c. Power of Attorney*
- d. Advance Health Directive*
- e. Person responsible or appointed guardian or administrator*

Who assists the client in making financial decisions?

- a. No one*
- b. Significant Informal Assistance*
- c. Power of Attorney*
- d. Formal financial manager or administrator*
- e. Person responsible or appointed guardian or administrator*

If the answer is (a) or conflict concerning these issues is apparent, consider referral for specialist assessment.

The ACAP ECRG also agreed that this question should be asked in the middle of the assessment process because the assessor will require sufficient time with the person to be able to rate these items.

The ACAP ECRG also considered whether a question should be included about whether a person is subject to State based mental health legislation or other legal issues and considered both the ACCNA-R and ONI-N (optional item) items:

The ACCNA-R item:

Does the Mental Health Act affect the care recipient (Yes, No, Don't Know)?

ACCNA-R and ONI-N also contain the following item:

Are there other relevant legal issues (Yes, No)?

In the ONI-N and the ACCNA-R these additional questions form part of an optional financial and legal profile and are not routinely asked in every assessment. Although the items concerning decision making capability should be considered for every client, the ACAP ECRG did not consider additional questions were required concerning a person's status under State based mental health legislation or other legal issues.

Recommendation: The ACAP ECRG recommends that the item (assessor-rated) based on the ACCNA-R and ONI instruments is used to screen for decision making capability and is included in the standardised ACAT assessment.

4.1.3 Cognition Related Diagnoses

The ACAP ECRG initially considered the inclusion of some items concerning the formal diagnosis of dementia and psychiatric disorders.

It is noted that Question 28 in the ACCR asks the assessor to list all diagnosed diseases and disorders that may have the greatest impact on the client's need for assistance with activities of daily living and social participation. Thus additional items could be considered as duplication.

Recommendation: The ACAP ECRG recommends that as the items concerning the diagnosis of dementia and psychiatric diagnoses are already captured at Item 28 on the ACCR these items did not need to be included elsewhere in the standardised ACAT assessment.

4.2 Other Potential Screening Items: Cognitive Function

4.2.1 Communication and Comprehension Aspects

Following identification of communication as a potential gap in the assessment, the ACAP ECRG suggested that an item or items concerning communication should be included in the assessment.

The ACCR has communication/sensory items in Q35 that address speech, reading and writing rather than comprehension and expression. The ACAS CAF draft includes some assessor checklist items concerning comprehension, speech, reading and writing. The InterRAI HC contains an item on expression, verbal and non verbal - making self understood, and an item on comprehension, the ability to understand others. The ONI-N contains a self report communication item concerning whether the client needs help to communicate or be understood by others.

It was suggested that the item should be assessor rated and based on the observations and judgments of the assessor or other informant. Some suggested items are outlined below. These have been inspired by similar items in the Inter-RAI HC but the item stems and response options are somewhat different.

Assessor Rated: *When communicating with others can the client be understood (includes both verbal and non verbal aspects)?*

- Expresses ideas adequately and can be understood
- Has some difficulty expressing thoughts and is not always understood
- Has major difficulty expressing thoughts and is rarely understood
- Is not fluent in English, interpreter may be required

Assessor Rated: *Does the client understand what others are saying to him/her? (With any appliance normally used)*

- Has adequate comprehension
- Has some comprehension difficulties but understands some of the message
- Has major difficulties in understanding others most of the time
- Is not fluent in English, interpreter may be required

Following discussion the ACAP ECRG recommended two items for inclusion in the standardised assessment. One of these concerns whether an interpreter is needed and the other concerns communication aspects:

Assessor Rated. *Is an interpreter required (Yes / No)?*
If 'yes' arrange for an interpreter.

Does this person have difficulty in communicating with others (Yes / No)?
If 'yes' consider referral to an appropriate health professional.

The ACAP ECRG considered that the item concerning an interpreter should be asked during the intake process or when the assessment appointment is arranged.

The ACAP ECRG suggested the question concerning communication should also be asked early in the assessment around the same time as the questions concerning vision and hearing. It is noted this item does not differentiate between the expression and comprehension aspects of communication. This issue could be addressed in the proposed training manual or tool kit.

Recommendation: The ACAP ECRG recommends that items concerning the need for an interpreter and communication are included in the standardised ACAT assessment.

4.3 Reviewed Core Assessment Instruments: Cognitive Function

The following instruments are comprehensively reviewed in this report: Standardised Mini-Mental State Exam (Molloy et al., 1991); the IQCODE (Jorm, 2004); the KICA-Assessment tool including KICA-Cog Instruments (LoGiudice et al., 2006); and the KICA-Carer (Smith et al., 2009; Stevenson, Smith, and Strivens, 2008). Some of the recommended instruments such as the RUDAS (Storey et al., 2004) and the MMSE-3MS (Teng and Chui, 1987) have previously been reviewed in the DOMS report (Sansoni et al., 2008) and these extant reviews will be used where appropriate. These instruments have been rescored using the instrument review criteria from the ACAP AHOC evaluation framework developed for this project (refer Table 3).

The DOMS report (Sansoni et al., 2008) recommended the Modified Mini-Mental State Exam (3MS; Teng and Chui, 1987) for cognitive assessment. This was because, following a targeted review, the 3MS was found to have somewhat better psychometric properties as it was more sensitive to different levels of severity of cognitive impairment.

The ACAP ECRG recommended the Standardised MMSE (Molloy et al., 1991) as the preferred instrument for cognitive assessment because many ACAT teams are far more familiar with the Standardised MMSE and the 3MS is slightly more complicated to administer.

The 3MS and the Standardised MMSE are briefly compared in the discussion and on the instrument comparison tables from the evaluation framework (refer Table 2 and Attachment 1). The Standardised MMSE is subject to copyright restrictions that may not apply to the 3MS and this has the potential to contribute to the cost of an ACAT assessment.

The ACAP ECRG also considered it was desirable that two proxy / informant measures for cognitive assessment be reviewed. These are the IQCODE (Jorm, 2004) and the KICA-Carer (Smith et al., 2009).

The comprehensive reviews of all cognitive assessment instruments are at Attachment 5 and a description of each instrument is provided in Sections 4.3.1 - 4.3.4. A copy of the cognitive assessment tools is at Attachment 3. A summary of the comparative ratings for these instruments are in Table 2 below. Each rater scored the instruments separately and then a consensus was reached. All instruments demonstrate adequate reliability and validity.

Table 2 Summary of Ratings for Cognitive Assessment Instruments

Criteria	Weight	MMSE (3MS)	SMMSE	RUDAS ^a	KICA-COG	KICA-CARER	IQCODE
Theoretical/empirical basis	3	3	3	3	3	3	3
Availability of comparison data	3	3	2	2	2	2	2
Length/feasibility of instrument for inclusion in battery	2	2	3	2	2	3	2
Complexity of administration/cognitive burden	2	2	2	2	3	3	3
Cultural Appropriateness	1	2	2	3	3	3	2
Ease of obtaining score	2	2.5	2.5	3	3	3	3
Sensitivity	3	3	2.5	2	2	2	2.5
Reliability evidence	3	3	3	3	2.5 ^b	2 ^b	3
Validity evidence	3	3	3	2.5 ^b	2.5 ^b	2 ^b	3
Cost of the instrument	2	3	2 ^c	2	3	3	3
Cost of instrument administration	2	2	2	2	2	2	2
Weighted Total		70	65.5	62.5	65	64	68.5

a. Based on the DOMs review in 2007 – this review needs to be updated

b. Scored as 2 or 2.5 because of there being limited evidence/publications or independent publications but what there is indicates good sensitivity, validity and/or reliability.

c. Rated as 2 vs.1 as the costs are minimal and estimated at 12 cents per use

4.3.1 Standardised Mini Mental State Examination

The Standardised Mini-Mental State Examination (SMMSE) is a commonly used adaptation of the Mini-Mental State Examination (MMSE) (Molloy, Alemayehu and Roberts, 1991). It was developed to overcome the wide variability in administering and scoring the MMSE (Burns et al., 2004). This version improves the consistency in administering and scoring of the MMSE. It includes explanatory questions, time restrictions for answering the questions and detailed scoring instructions. A copy of the SMMSE is at Attachment 3.

The SMMSE, like the MMSE, contains items that assess orientation, memory, attention, calculation, language and constructional ability. It involves verbal responses and the ability to respond to verbal and written commands (Pangman et al., 2000). The SMMSE takes approximately 10 minutes (less time than the MMSE) to administer (Burns et al., 2004) and scores range from 0 to 30 points. Lower scores indicate greater impairment.

Vetesi et al. (2001) outline the following scoring interpretation for assessing cognitive impairment: 30 = No impairment; 26 – 30 = Considered normal; 20 – 25 = Mild; 10 – 19 = Moderate; 0 – 9 = Severe.

In summary, the SMMSE is an important attempt to overcome the wide variability in administering and scoring of the MMSE. The standardised instrument demonstrates improved inter-rater reliability and high correlations with the original scale. However, there is limited evidence on the SMMSE when compared to the MMSE or 3MS. What evidence there is indicates it is somewhat less sensitive to the degrees of severity of cognitive impairment than the 3MS (Jeon in Sansoni et al., 2008).

The Standardised MMSE is subject to copyright restrictions that may not apply to the 3MS and this has the potential to contribute to the cost of an ACAT assessment. From the review (refer Attachment 5), a number of issues require further investigation. These included: developing age-related population norms, determining appropriate cut-points for cognitive impairment, and investigation of possible ceiling effects. Additional information is required on the instrument's internal factor structure, correlation with the 3MS and other short measures of cognitive function, for example the GPCOG; and as well as use with Indigenous people or people from CALD backgrounds.

The Standardised MMSE has been recommended as it has adequate reliability, validity and sensitivity. It is also a little easier to score and use than the 3MS and many ACAT assessors and other health professionals are more familiar with this instrument.

Recommendation: The ACAP ECRG recommends the Standardised Mini-Mental State Examination is included for the assessment of cognition in the standardised ACAT assessment.

4.3.2 The KICA Assessment Tools

The KICA-Cog is a cognitive screening tool for dementia in Aboriginal and Torres Strait Islander peoples aged over 45 years who live in rural or remote regions. It is the patient cognitive subsection of the Kimberley Indigenous Cognitive Assessment (KICA). It was developed in the Kimberley region of Western Australia in liaison with a large number of health, cultural and community organisations, and validated in the Kimberley, the Northern Territory and Far North Queensland including the Torres Strait. It can be downloaded from www.wacha.org.au. A KICA-Cog training DVD is available at no cost.

It is recommended that the other KICA components are conducted in addition to the KICA-Cog for further information on cognitive status and possible co-morbid conditions and differential diagnoses. A score of 33 or below out of 39 indicated that a referral is required to a medical practitioner for review for possible dementia. The sKICA (KICA-Screen) can be used when time is limited. It is recommended that the KICA-Carer is also used. A copy of the KICA-Cog and KICA-Carer can be found at Attachment 3.

The KICA-Carer is an informant questionnaire given by the interviewer. It is the informant cognitive subsection of the Kimberley Indigenous Cognitive Assessment (KICA) that was developed and validated in the Kimberley region of Western Australia. A score of 3 or above out of 16 indicates that a referral is required to a doctor to review for dementia. It is recommended that the other KICA components are conducted in addition to the KICA-Carer for further information on cognitive status and possible co-morbid conditions and differential diagnoses.

As the instrument ratings in Table 2 and the review in Attachment 5 indicates these tools have good psychometric properties (e.g. reliability, validity, sensitivity) and are the most appropriate tools for the cognitive assessment of Indigenous Australians living in rural and remote locations. Research and application of these new scales by other researchers and clinicians should be encouraged.

Recommendation: The ACAP-ECRG recommends the KICA-Cog and KICA-Carer instruments are included in the standardised ACAT assessment for the cognitive assessment of Indigenous people living in rural and remote areas.

4.3.3 Rowland Universal Dementia Assessment Scale

The RUDAS is a short multicultural cognitive screening tool for the assessment of dementia. It was developed and validated in an area where 40% of the population are born in non-English speaking countries and more than 80 languages are spoken. Developers included experts in the field of dementia care and representatives from 22 cultural and linguistic groups. The items are culturally fair and easily translated. The instrument is interviewer administered and takes about 10 minutes

to complete. Training is required but is readily available at a low cost of \$15.00. Evidence relating to psychometric properties is limited as the instrument is new, but existing data is promising with results indicating the instrument is valid and reliable (Sansoni et al., 2008). A copy of the RUDAS is at Attachment 3.

Recommendation: The ACAP ECRG recommends the Rowland Universal Dementia Assessment Scale is included in the standardised ACAT assessment for the cognitive assessment of people from culturally and linguistically diverse backgrounds.

4.3.4 IQCODE

The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) (Jorm, 2004) is an Australian developed and widely used, informant based measure to screen for dementia. The short and recommended version of the questionnaire includes 16 items examining everyday cognitive abilities for example remembering own telephone number and learning new things, with a few functional items including handling money for shopping) (Sansoni et al., 2008). It looks at changes in “the everyday cognitive function of an elderly person and aims to assess cognitive decline independently of pre-morbid ability” (Burns et al., 2004, page 348).

The IQCODE looks at the following domains: episodic memory, semantic memory, procedural memory, working memory, language comprehension, language production and executive function (Langley, 2004) and takes 10 - 15 minutes to administer (Burns et al., 2004). Scores range from 16 to 80 points on the 16 item version. The informant or proxy rater responds to the 16 statements on a 5 point likert scale in terms of a change in functioning. The scale categories are: 1 = Much improved; 2 = A bit improved; 3 = Not much change; 4 = A bit worse; 5 = Much worse. A copy of the IQCODE is at Attachment 3.

Higher scores indicate greater impairment (Langley, 2004). Scores below 3.00 indicate improvement, 3.00 indicates no change, 3.01 – 3.50 indicates slight decline; 3.51- 4.00 indicates moderate decline; and 4.01 – 5.00 indicate severe decline.

The IQCODE is the leading proxy / informant measure for dementia screening and assessment (McDowell, 2006; Sansoni et al., 2008). It is a well validated measure (including studies using neuropsychological measures and neuro-imaging). It provides accurate information which compliments cognitive testing and is relevant to the diagnosis of dementia. It is also a good screen with comparable results to other methods including the MMSE. The instrument is unaffected by education, language and premorbid ability (Jorm, 2004) and “also appears to have overcome the common bias in such tests toward people with higher education” (McDowell, 2006, page 454).

The main practical criticism of the IQCODE is the potential that a client may lack a suitable informant who has known them for 10 years. Langley (2004) criticises the 10 year time frame on the following grounds: 1) not all carers know the client for more than 10 years; 2) 10 years is a long period for the informant to recall accurately; 3) over a 10 year recall period ageing effects may be misattributed to dementia. Langley (2004) suggests that a time frame of 5 years may be more appropriate.

Some other issues also required further research; these include issues regarding the instrument’s factor structure, and the validity of IQCODE scores in relation to different types of informant.

Overall, this scale has good psychometric properties and is a highly regarded informant measure and it is mostly used as a supplement to cognitive assessment for people with dementia.

Recommendation: The ACAP ECRG recommends that the IQCODE is used as a supplement to cognitive assessment for people with Dementia.

4.4 Suggested Follow-up Instruments: Cognitive Function

Recommendation: No instruments are suggested for a follow-up assessment for cognition. Although there are instruments which could be used, for example, when frontal temporal dementia is suspected it is thought that referral to a relevant specialist for diagnosis would be advised rather than for ACAT assessors to use such instruments.

5 Behavioural and Psychological Assessment

Examining behaviour and psychological symptoms allows for the assessment of common mental health problems experienced by older people, including depression, dementia and delirium. These issues are important co-morbid symptoms or states which exacerbate medical symptoms in older people. Behavioural problems are also major drivers in the need for additional resources for supervision or placement in residential care facilities. Looking at this aspect of a person's functioning also allows for an assessment of a person's well-being and quality of life.

The ACAP ECRG suggested the identification or development of screening items for depression, dementia and associated behavioural and psychological symptoms, and delirium. Behavioural and psychological health problems will affect the person's ability to manage their lives independently in the community; their presence will trigger the need for appropriate referral and will be relevant to assessing eligibility for support services.

5.1 Depression/Mental Health

The ACAP ECRG initially suggested the following item to screen for depression. It is included in the ACCNA-R:

In the past four weeks have you often felt sad or depressed (Yes / No / Unsure)?

One of the problems for this question is that it does not define 'often' in the item stem and people may interpret this differently. Some suggested modifications to the response options might solve this problem as outlined below (or other response categories e.g. from none of the time to all of the time could also be used):

In the past four weeks have you felt sad or depressed?

Never/rarely (i.e. less than once in the last 4 weeks)

Sometimes (i.e. less than once a week but once or more in the last 4 weeks)

Often/usually (i.e. less than once a day but once or more a week)

Always (i.e. once a day or more)

The ACAP ECRG considered that the suggested screening item from ACCNA-R, even with modification, may not be sufficiently sensitive to identify those at risk for depression. Searches indicated the original derivation of this item is from Mahoney et al. (1994) who has reported a sensitivity of 69% and a specificity of 90% for the item. Lim et al. (2000) report sensitivity of 64% and a specificity of 94.9% in a Chinese study.

Sensitivity relates to the percentage of patients who are correctly identified as having depression and specificity relates to the percentage of patients who are correctly identified as not having depression in comparison to a gold standard measure such as a standardised clinical diagnosis. Shah et al. (1992) stated that an adequate screening instrument for depression should have at least a sensitivity and specificity of over 70%. This item does not have sufficient sensitivity – that is it would be considered marginal in correctly identifying those with depression although it is quite good at identifying correctly those that don't have depression. For this reason other single items or short scales might be preferred.

A range of individual screening items were further examined by the ACAP ECRG including a number of individual items from the Geriatric Depression Scale. Some of these items focussed more on life satisfaction or feelings of helplessness and most items did not have sufficient sensitivity or specificity to warrant further consideration.

A single item from the Brief Mental Health Inventory (MHI-5; Berwick et al., 1991) was considered as it has also been used in population surveys. This item is:

Over the past 4 weeks have you felt downhearted and blue? (US) / Have you felt down? (Australia)/ Have you felt down and depressed? (International Version; SF-36 Version 2).

McDowell (2006) reports this item detected nearly 75% of the Diagnostic Interview Schedule disorders with only a 5% false-positive rate (e.g. the person is incorrectly identified as depressed from the item when the gold standard/ standardized clinical assessment has indicated they are not). Yamazaki et al. (2005) report this was the best performing item for detecting severe depressive symptoms and that it had a sensitivity of 88% and a specificity of 77%. Although this item appears to have performed quite well in its original version, the changes over time to modify the response categories and to linguistically validate the scale for the Australian or International versions would suggest more recent data is required to confirm these original findings. This item appears to be the best for use as a single screening item for depression.

Most recognised brief mental health and depression screening instruments such as the Kessler 10 (Andrews and Slade, 2001; Kessler et al., 2002); the Brief Mental Health Inventory (MHI-5; Berwick, et al., 1991) or the shortest version of the Geriatric Depression Scale (GDS-4; Shah et al., 1997) contain more than 1 item. It should also be noted that the MHI-5 and the Kessler -10 are screening for depression and anxiety whereas the GDS-4 and the single items mentioned above are only screening for depression.

In the ONI-N, the Kessler 10 instrument is used to screen for depression and anxiety. This instrument may seem a little lengthy as an initial screen with 10 items. It does have the advantage, however, that Australian norms are available for the instrument as it was included in the 1997 ABS Mental Health and Wellbeing Survey (ABS; 1998) and the 2006 NSW Health Survey (NSW Health, 2006).

The Brief Mental Health Inventory (Berwick et al., 1991) uses 5 items from the Mental Health Inventory (Viet and Ware 1983; Ware et al., 1984) which are also the items used as the mental health scale within the Rand Short Form 36 instrument (Hays et al., 1993; Ware et al., 2001). Australian norms are available for both Version 1 and Version 2 of the SF-36 and thus normative data is also available for Version 1 (original) and Version 2 (International) of the MHI 5 items (ABS, 1997; Hawthorne 2006). The items are as follows and have 6 response levels ranging from all of the time to none of the time.

How much of the time, during the past 4 weeks

- a. *Have you been a very nervous person? / Have you been very nervous? (International Version)*
- b. *Have you felt calm and peaceful?*
- c. *Have you felt downhearted and blue? (US) / Have you felt down? (Australia)/ Have you felt down and depressed (International Version; SF-36 Version2)*
- d. *Have you been a happy person? / Have you been happy? (International Version)*
- e. *Have you felt so down in the dumps that nothing could cheer you up?*

McDowell (2006) reports the Brief Mental Health Inventory (BMHI) is quite widely used and performed almost as well as the 18 item version in detecting any Diagnostic Interview Schedule (DIS) disorder, with areas under the ROC curve of .79 and .80 respectively. He reports that item-total correlations ranged from 0.54 to 0.81; and the Cronbach's alpha was 0.90 in one study and 0.86 in another. It is recommended that the MHI-5 (Berwick et al., 1991) with Australian wording (Sanson-Fisher and Perkins, 1998) could be considered as a follow-up screening tool. This short measure has a reasonable rate of detection for both anxiety and depression disorders. It is considered useful that it covers both of these aspects, and has the advantage that it is not as long as the Kessler 10.

Initially the ACAP ECRG considered the BMHI for screening for mental health issues but became concerned about the number of items in the overall screening assessment. The ACAP ECRG suggested a modification to the MHI-5/ SF-36 depression item:

Over the past four weeks have you felt down or depressed more than half of the time (Yes / No)?

If 'yes', or if the assessor suspects the client may be depressed, the assessor should consider a further assessment using the Geriatric Depression Scale-15 and then consider referral to a relevant health professional.

This item is a substantial modification of a well validated item from the SF-36V2 (Ware et al., 2001). As it is considered preferable to use validated items wherever possible the psychometric properties of this modified item will need to be assessed if a pilot study is undertaken. As the item modification is quite substantial it is thought that copyright concerns may not be an issue although this would need to be confirmed.

Recommendation: The ACAP ECRG recommends a modified BMHI screening item for depression for inclusion in the standardised ACAT assessment. If a client answers 'yes' to this item then a further follow-up assessment using the GDS-15 could be considered. The ACAP ECRG recommends that the GDS is used as the follow-up tool for most clients; but for clients with moderate to severe dementia an alternative method of assessment might be used.

The DOMS review of the Cornell Scale for Depression in Dementia is provided in Attachment 6. The ACAP ECRG notes that this is a complex instrument that requires specific training in its administration.

5.2 Dementia, Behaviours of Concern, and Delirium Items

The ACAP ECRG suggested including some screening questions on dementia, delirium, behaviours of concern and changes in mental state over the past 3 months.

Question 35 in the ACCR already contains has a checklist for Cognitive Behaviour and Psychological Aspects. This includes some cognition items for example memory problems, as well as 'behaviours of concern', depression and delirium items. Each problem or behaviour is rated as unable to determine /never /occasionally / regularly / always. It includes the following behaviours:

<i>Short term memory problems</i>	<i>(cognitive assessment)</i>
<i>Long term memory problems</i>	<i>(cognitive assessment)</i>
<i>At risk behaviour</i>	
<i>Aggressive verbal behaviour</i>	
<i>Aggressive physical behaviour</i>	
<i>Hallucinations/Delusions</i>	
<i>Wandering</i>	
<i>Disturbed sleep/Insomnia</i>	<i>(sleep items)</i>
<i>Depressive Symptoms</i>	<i>(depression items)</i>
<i>Confusion</i>	<i>(cognitive assessment)</i>
<i>Disorientation for time</i>	<i>(cognitive assessment)</i>
<i>Disorientation for place</i>	<i>(cognitive assessment)</i>
<i>Disorientation for person</i>	<i>(cognitive assessment)</i>

Much of this checklist can be populated from a consideration of the suggested cognitive assessment, and the screening items for depression and sleep. Thus the focus should be on finding items that would assist an assessor to populate the remainder of the ACCR checklist including: at risk behaviour, aggressive verbal and physical behaviour, hallucinations/delusions and wandering.

The ONI-N contains a global item concerning behaviour and psychological problems. This item is: *Does the person have behavioural problems for example, aggression, wandering or agitation (Yes / No)?*

The ACCNA-R contains a question concerning '*Challenging Behaviour – What level of support is required for the behaviour?*' Challenging behaviour describes behaviour that is problematic. It is

socially inappropriate behaviour that can disturb other people or it can be harmful in some ways to others' (CCASS Data Dictionary, V2.2, 2008). A related item for the assessor to complete is a Yes/No checklist for the following behaviours: wandering, verbal, physical, verbal refusal to cooperate, physical agitation, socially inappropriate. If any behaviour is endorsed 'yes', then there is a follow up question concerning the frequency of the client's particular behaviour (sometimes, often, regular, multiple times every day) as rated by the assessor.

The InterRAI HC contains a frequency checklist of behaviour symptoms. These items are wandering, verbal abuse, physical abuse of others, socially inappropriate and disruptive behaviour, inappropriate public sexual behaviour or public disrobing, and resisting care. This is similar to the item provided in the ACCNA-R and the checklist in the draft ACAS CAF.

Most of the above approaches cover no additional information than is provided in Q35 of the ACCR. However, as it is difficult to answer Q35 of the ACCR if an assessor has had limited contact with a client; the suggested strategy is to include some questions for the assessor to ask of an informant before rating these items.

Informant based assessor rated item:

1. Does (the person) have behavioural problems for example, aggression, agitation, wandering, socially inappropriate behaviour or sexual disinhibition?

Yes _____ (insert behaviour)
 No

If yes, how frequently do these behaviours occur (Occasionally / Regularly / Always)?

Informant based assessor rated item:

*2. Have you noticed a change in the person's mental state over the last 3 months (Yes / No)?
 If 'yes' consider referral for medical assessment*

The ACAP ECRG recommends the inclusion of the item concerning behavioural problems. The second item concerning the change in mental state was slightly modified:

Informant based assessor rated item:

*Has there been a sudden change in mental state recently (Yes / No)?
 If 'yes' consider referral for an urgent medical review*

If a client is exhibiting a number of these behavioural problems referral to a relevant health professional/medical practitioner for review would be recommended. If the informant has noted a major change in a client's mental state recently this may indicated the presence of delirium and a referral for urgent medical review would be warranted.

The ACAP ECRG also considered an item concerning the presence of other behavioural symptoms for example hallucinations, delusions, easy distractibility etc., but decided the two items identified above would be sufficient.

Recommendation: The ACAP ECRG recommends the inclusion of two informant items concerning behavioural problems and acute changes in the client's mental state.

5.3 Suggested Follow-up Instruments: Behavioural and Psychological Assessment

5.3.1 Depression

The Geriatric Depression Scale – 15 item (GDS; Brink et al., 1982; Yesavage et al., 1983) is recommended as the primary follow up instrument and a review of this instrument is available from the DOMS report (Sansoni et al., 2008). The DOMS report also included a review of the Cornell Scale for Depression (Alexopoulos et al., 1988) but this instrument was not preferred by the ACAP ECRG due to the complexity of administration and training requirements. These extant reviews are provided in Attachment 6.

The GDS-15 focuses on the affective aspects of depression as Brink et al. (1982) and Yesavage et al. (1983) claim that somatic items are not particularly useful indicators of depression among the elderly. The GDS is a widely used and researched self-report instrument for the assessment and screening of depression in elderly people. The GDS compares favourably with other rating scales and self report measures of depression, for example, Hamilton Rating Scale for Depression (HRSD) and the CES-D; while being easier to administer and complete for elderly people (McDowell, 2006; Marosszeky, 2007).

The GDS has been used in hospital, community / primary care and residential settings (Bowling, 2005). Its reliability is good and its sensitivity and specificity has been found to be high amongst samples of cognitively intact elderly people (McDowell, 2006). The comprehensive review undertaken by Marosszeky in 2007 (Sansoni et al., 2008) noted that care is needed when interpreting data from the GDS-15 obtained from community and hospital samples, as there is some evidence of lower reliability for this version of the scale outside of residential care settings.

In terms of psychometric development, further research is needed in the following areas: (1) the issue of detecting minor levels of depression with the GDS (Watson and Pigone, 2003); (2) the use of the GDS for those that are 75 years and older (McDowell, 2006); and (3) the applicability and suitability of the GDS for those with dementia / cognitive impairment. MacGivney et al. (1994) found much poorer sensitivity and specificity for the GDS when used with older persons with an MMSE score of 14 or below. This restricts the applicability of this instrument to those with cognitive impairment although it must be remembered that this scale was not specifically designed for people with dementia/ cognitive impairment.

Korner et al. (2006) provide a direct comparison study with the Cornell Scale for Depression (CSDD) and note the CSDD performs better in dementia samples and thus recommend that the CSDD is used to assess clients diagnosed with moderate to severe dementia. McDowell (2006) recommends that, as with most self-rating scales, it should be followed by a psychiatric interview to confirm the classification.

The GDS has been assessed as having adequate reliability and validity and is recommended as a follow-up assessment tool for elderly clients with no obvious cognitive impairment or dementia.

Recommendation: The ACAP ECRG recommends that the GDS is used as the follow-up tool for most clients; but for clients with moderate to severe dementia an alternative method of assessment might be used.

The DOMS review of the Cornell Scale for Depression in Dementia is provided in Attachment 6. The ACAP ECRG notes that this is a complex instrument that requires specific training in its administration.

6 Assessment of Social Function

Social isolation can be a problem for some older Australians as they may become increasingly disconnected from society as a result of increased frailty, death of a loved one, or when family members or friends die or move away. An older person who experiences social isolation can become depressed and prone to a range of physical conditions that can continue to affect their quality of life (Council on the Ageing, NSW; 2003)

The assessment of social functioning, in particular social isolation, provides a marker a person's social connectedness and community participation. It plays an important prevention or early intervention function by identifying and engaging with a client and assists to link a client with appropriate services such as community mental health or carer support services.

The ACAP ECRG suggested a number screening items concerning social support; time alone, friction, abuse, and neglect and major life stressors. Screening or trigger items for carer aspects were also suggested. The assessment of these factors will ascertain a person's ability to manage their lives independently in the community and will also be relevant to assessing eligibility for community support services.

6.1 Suggested Screening Items

6.1.1 Social Function: General Discussion

The ACAP ECRG suggested examining the items from the InterRAI and the ACCNA-R to select or develop items for this domain. As discussed earlier, permission was not granted to use the InterRAI items; however, some consideration has been given to the aspects of social relationships they cover. Items from other commonly used surveys were also considered by the ACAP ECRG as discussed below.

The InterRAI HC asks the assessor to rate how recently (up to the last three days) a client has had social contact or participated in social activities. The elements are:

Participation in social activities of long standing interest
Visit with a long standing social relation or family member
Other interaction with a long-standing social relation of family member e.g. telephone, email
Conflict or anger with family or friends
Fearful of a family member or close acquaintance
Neglected, abused, or mistreated

The ACCNA-R has an item on satisfaction with regard to a client's level of social participation:
Are you satisfied with your level of activity, participation and social involvement (Y/N/ Not sure)?

There is a follow up question:

What is preventing you from being more socially active and involved? (Comment/ text insert)

There is also a question on loneliness:

In the past 4 weeks have you often felt isolated or lonely (Yes / No / Not sure)?

The ONI-N has a trigger item to determine whether a client needs to be assessed on the Optional Social and Emotional Profile (OSEP) which includes both depression/anxiety aspects as well as social relationships. This trigger item is:

During the past 4 weeks, how often have you experienced any of the following?

- *Felt very nervous, down of lonely*

- Got sick and had to stay in bed
- Needed someone to talk to

(Most of the time / no not at all / sometimes / occasionally / not sure)

This item is thought to encompass too many different aspects particularly as depression and anxiety aspects have been dealt with in the section concerning behavioural and psychological aspects.

The draft ACAS CAF contains a Social, Family and Cultural Profile. The assessor records details concerning primary family relationships including the person's partner, children and extended family and friends with a space to enter strength and risks considerations. It is suspected that what may be inserted could be highly variable.

A common problem amongst these approaches is that the questions are often double barrelled or asking about more than one aspect for example, activity, participation and social involvement. Very few of these items would provide accurate information about the degree, type, or frequency of social support being received. For example, the focus of the ONI-N items is the availability of a support person when the client is experiencing problems rather than assessment of the degree of social support available to the client. However, the latter item could possibly used as a trigger item for a follow-up assessment of perceived social support.

The ACAP ECRG suggested that the initial trigger items should cover: 1) loneliness 2) time spent alone and 3) the availability of a person to help you when there are problems. If these items indicate the client is lonely or spends a lot of time alone or has no one to help then this could trigger a follow-up assessment concerning perceived social support using the Lubben Social Network Scale-6 (Lubben et al., 2006), however, this was not recommended by the ACAP ECRG. Other items would examine issues such as friction in relationships and recent social stressors.

Recommendation: The ACAP ECRG did not consider a follow up assessment of perceived social support was necessary.

6.1.2 Loneliness, Time Alone and Help Availability

A survey item used in UK (Victor et al., 2005) and in Australia (Steed et al., 2007) addresses the issue of loneliness as below:

Would you say that you are (Never lonely / Sometimes lonely / Often lonely / Always lonely)?

Although the item outlined has been validated and used in a number of Australian and international surveys (allowing for data comparisons) the ACAP ECRG suggested the following modification to this item:

Would you say that you are often lonely (Yes / No)?

If 'yes' explore the issues further and consider referral to relevant community support services.

As it is considered preferable to use validated items wherever possible, the psychometric properties of this modified item should be assessed if a pilot study is undertaken.

Steed et al. (2007) also mention they included an item of time spent alone and this had a high correlation with responses to the loneliness question above. An item to assess time alone is outlined below:

On a typical day (excluding night time) how much of the time do you spend alone (Less than 3 hours alone / 3-4 hours alone / 5-8 hours alone / 9 hours alone or more)?

The ACAP ECRG did not consider an item on time spent alone should be included in the assessment.

A modified item concerning the availability of help when needed from the ONI-N was suggested for consideration:

During the past 4 weeks, was someone available to help you if you needed and wanted help? For example if you...felt nervous, got sick and had to stay in bed, or needed someone to talk to.

- a. *someone was available to help me whenever I needed or most of the time*
- b. *someone was available to help me some of the time*
- c. *someone was available to help me a little of the time*
- d. *not at all, no one was available to help me*

The ACAP ECRG has made further modifications to this item:

During the past 4 weeks, was someone available to help you if you needed and wanted help (Yes / No)?
If 'yes' explore the issues further and consider referral to community support services.

Scores that are indicative of loneliness and the lack of availability of help when needed are relevant to considering a referral to community support and other relevant programs.

Recommendation: The ACAP ECRG recommends that the modified items on loneliness and the availability of help are included in the standardised ACAT assessment.

6.1.3 Friction, Conflict and/or Neglect

Although the ACAP ECRG originally recommended the inclusion of some screening items to cover these aspects it was considered that some of these items may be over and above what is required in an ACAT assessment. It was agreed that an assessor-rated question concerning mistreatment is included:

Is there any indication that this person has been abused, mistreated, or neglected (Yes / No)?
If 'yes' the assessor should follow the local elder abuse protocol.

Recommendation: The ACAP ECRG recommends that a question concerning mistreatment or abuse is included in the standardised ACAT assessment.

6.1.4 Recent Stressful Events

The ACAP ECRG considered that it would be useful for an ACAT assessor to know if the person had suffered any recent stressful events that may affect their presentation at assessment. Following an examination of the relevant tools and instruments, the following item is suggested:

Has the client experienced one or more major stressful life events over the past 3 months? (These events could include a bereavement or severe illness/ injury of self/family/ friend, separation from partner/family, major financial loss or being the victim of a crime).

Yes _____ (specify event)
 No

If 'yes' explore further and consider its contribution to the client's current presentation

While this item does not relate directly to items within the ACCR, it may be that some of a client's behaviours are precipitated by extreme stress which may affect their current ability to cope. An example might be, if a man's wife has died recently he may need to develop further IADL skills, for example preparing meals, and thus may require community support services.

Recommendation: The ACAP ECRG recommends an item on recent stressful events is included in the standardised ACAT assessment.

6.1.5 Triggers for Carer Needs or Burden Assessment

The ACCR contains information about Carers in Section 3. The suggested screening items are a supplement to the ACCR items and would assist the assessor to determine the care and support services a client requires. The answers to these questions would also trigger a referral for carer assessment.

In the ONI-N the initial questions address Carer Need and Carer Availability as follows:

Carer need

*Record: (1) The consumer cannot be left on their own at any time (whether by day or night);
(2) The consumer can only be left on their own for some, but not all, of the time (day or night);
(3) Nil, no Carer required*

The Optional Carer Profile (ONI-N), apart from basic socio-demographic information, includes items concerning carer supports, threat to carer arrangements, and carer sustainability. These three items could then be used to trigger a carer assessment. These items are:

Carer Support

(Answer: Yes / No / Not sure / No carer)

Does Carer have someone to help them?

Does Carer receive a Carer Payment or Allowance?

Has Carer been given information about available support services? Does Carer need practical training in lifting, managing medicine or other tasks?

Current Threats to Carer Arrangements

(If there are any threats to carer arrangements tick all that apply)

Carer – emotional stress and strain; or acute physical exhaustion/illness; or slow physical health deterioration; or factors unrelated to care situation.

Consumer – increasing needs; or other factors.

Carer sustainability

Are carer arrangements sustainable without additional services or support?

Record: (0) Yes, carer arrangements are sustainable without additional support (1) No, carer arrangements likely to break down within months; (2) No, arrangements have already broken down; (8) Don't know).

Similar trigger items are found in the ACCNA-R where the number of hours per week provided by the carer is seen as an indicator of carer stress. Associated questions include 'What would help the carer to continue their caring role?' 'Can you continue to provide assistance?' 'Does a friend neighbour or relative help?' 'How many people does the carer provide care for?' 'Is your role as a carer at risk because of your own needs?' The assessor then makes a judgement about whether the carer requires a CENA-R assessment.

The ACAP ECRG recommended the inclusion of the carer sustainability item from the ONI-N. A minor modification was suggested for this item as follows:

Are carer arrangements sustainable without additional services or support (Yes / No)?

If 'no' refer the carer for an assessment for eligibility for other types of care services, for example HACC services or carer respite programs.

Carer sustainability will affect the appropriate management of the client and identify the need for respite care.

Recommendation: The ACAP ECRG recommends the inclusion of an item on carer sustainability in the standardised ACAT assessment.

6.2 Suggested Follow-up Instruments: Social Function

The ACAP ECRG recommends no follow-up assessment tools are required for this domain of assessment.

7 Conclusion and Recommendations

In Sections 3-6 each of the domains of assessment (physical function, cognitive function, behavioural and psychological aspects and social function) have been discussed in turn. A number of screening items across all domains are recommended by the ACAP ECRG and a list of these items is at Attachment 2. The use of standard screening items will assist all ACAT assessors to identify the need further assessment for those people currently experiencing, or at risk of experiencing, difficulties in a specific area.

7.1 ECRG Recommended Assessment Tools by Domain

7.1.1 Physical Function

The ACAP ECRG recommends that every person receives an assessment of their functional capacity. The recommended instruments for the assessment of physical function (ADL and IADL components) are:

- Modified Barthel Index with Collin scoring (Collin and Wade, 1988).
- KICA-ADL (Smith et al., 2009; Stevenson et al., 2008): ADL and IADL assessment for Indigenous people living in rural or remote areas.
- OARS-IADL for the assessment of Instrumental Activities of Daily Living (Fillenbaum and Smyer, 1981).

The version of the Barthel which was selected for review was the Modified Barthel Index with Collin scoring (Collin and Wade, 1988). There are a number of modified versions of the Barthel but McDowell (2006) recommends this version. The scoring has been improved from the original Barthel Index (Mahoney and Barthel, 1965); it is easier to use than some of the other modified versions and it has adequate reliability, validity and sensitivity to change.

The KICA-ADL is recommended for the assessment of Indigenous Australians in rural and remote locations and information on this instrument can be found in the review of the KICA tools in Attachment 5. This is a promising new instrument currently undergoing validation; the ACAP ECRG considered it is the only instrument appropriate for use with Indigenous Australians from rural and remote locations.

For the assessment of function of Instrumental Activities of Daily Living (IADL) the OARS-IADL (Fillenbaum and Smyer, 1981) was selected for review. It has adequate reliability and validity and is easy to score, use and interpret. The KICA-ADL also contains information on IADL components and should be used for the assessment for Indigenous Australians, particularly those from rural and remote backgrounds.

The comprehensive reviews of all physical function instruments are at Attachment 4 and copies of these instruments are at Attachment 3.. A summary of the comparative ratings for these instruments is at Section 3.3.

The instruments recommended for the follow-up assessment of some dimensions of physical function are:

- Pain - The Brief Pain Inventory - Short (Cleeland, 1991), the Abbey Pain Tool (Abbey et al., 2004) or the Residents Verbal Brief Pain Inventory (Australian Pain Society, 2005).
- Dental - Questions from the South Australian Oral Health Referral Pad. The Oral Health Assessment Tool (Chalmers et al., 2005) could also be considered for use by ACAT assessors where there is limited access to a dental practitioner, for example in rural and remote areas.

- Contenance - the Revised Urinary Incontinence Scale and the Revised Faecal Incontinence Scale (Sansoni et al., 2006).

A number of Falls Assessment Tools were examined but none are recommended.

7.1.2 Cognitive Function

The ACAP ECRG recommends that every person receives a cognitive assessment. The recommended cognitive assessment instruments are:

- Standardised MMSE (Molloy et al., 1991).
- KICA-Cog and KICA-Carer (LoGiudice et al., 2006); for Indigenous people living in rural or remote areas.
- IQCODE (Jorm et al., 2004); to supplement the cognitive assessment of people with dementia.
- RUDAS (Storey et al., 2004); for people from Culturally and Linguistically Diverse Backgrounds.

The Standardised Mini Mental State Examination (SMMSE; Molloy et al., 1991) was recommended for comprehensive review. This instrument has been compared with the Modified Mini-Mental State (3MS) Examination (Teng and Chui, 1987) which was reviewed in the Dementia Outcomes Measurement Suite Project (Sansoni et al., 2008).

The comprehensive reviews of all cognitive assessment instruments are at Attachment 5 and examples of these instruments are at Attachment 3. A summary of the comparative ratings for these instruments is at Section 4.3.

It is noted that the 3MS scores slightly higher than the SMMSE mainly because the literature is more substantive, the instrument is less prone to ceiling effects, it is more sensitive to degrees of severity of cognitive impairment and the costs associated with using it are less. The SMMSE will have a charge of \$75,000 associated with its use nationally over a 3 year period. Given the substantial number of ACAT assessments undertaken each year this is relatively inexpensive but the ACAP will examine this issue as a separate exercise.

The ACAP ECRG preferred the Standardised MMSE to the 3MS because it will be more familiar to ACAT assessors, as many ACATs and Area Health Services already use it, and it is simpler and easier to use than the 3MS. The Standardised MMSE also scores well on all evaluation review criteria and is a step toward improved standardisation of administration and scoring, though this issue needs to be examined further in the Australian context.

The KICA–Cog and the KICA-Carer (cognitive assessment from informant) are recommended for the assessment of Indigenous Australians. Although these instruments have only recently been developed, and there are relatively few publications as yet, they have scored well on the evaluation review criteria.

The RUDAS (Storey et al., 2004) is recommended for the cognitive assessment of people from culturally and linguistically diverse populations. The review from the DOMS report (Sansoni et al., 2008) is included in Attachment 5. It should be noted this review was completed in 2007 and there may be further publications since that time that may affect the ratings for this instrument.

Where a client presents with dementia the IQCODE, an informant assessment of cognition (Jorm et al., 2004), is recommended as a supplement to cognitive assessment.

No instruments are recommended for the follow up assessment of cognition. Although there are instruments which could be used, for example, when frontal temporal dementia is suspected, the ACAP ECRG recommends that referral to a relevant health practitioner or specialist for diagnosis would be advisable rather than for ACAT assessors to use such instruments.

7.1.3 Behavioural and Psychological Function

The ACAP ECRG does not recommended a core assessment instrument for the assessment of a person's behavioural and psychological needs. The ACAP ECRG, recommends the 15 item Geriatric Depression Scale (GDS) as a follow up tool for most clients, noting that an alternative method of assessment may be more appropriate for those clients with moderate to severe dementia.

7.1.4 Social Function

The ACAP ECRG does not recommended any core assessment or follow up instruments for the assessment of a person's social function.

7.2 ECRG Recommended Next Steps

An appropriate form needs to be developed to incorporate the recommended screening items and the assessment instruments. The ACAP ECRG recommends that consideration is given to the development of an electronic form to supplement the Aged Care Client Record (ACCR) and integrate the administrative and assessment processes in one common electronic system. As the ACAT completes the screening items and assessment tools the responses could populate the relevant sections of the ACCR.

The ACAP ECRG recommends that a pilot study is undertaken using the recommended assessment instruments and screening items. A pilot study would enable the refinement of these components prior to any broader implementation. A pilot study would also be useful to assess the psychometric properties of some of the new and/or revised screening items suggested by the ACAP ECRG. To assess the reliability and validity of the screening items a large sample size would be required.

The implementation of a standardised approach to assessment has implications for the training of ACAT assessors. The ACAP ECRG recommends the development of a Tool Kit, as a companion volume to the Aged Care Assessment and Approval Guidelines. This would include instructions on how to use and interpret all screening items, core assessment instruments and follow up assessment instruments. Standard forms should be developed for all instruments. Training material would also include follow-up strategies and referral pathways. The materials developed on the use and interpretation of the assessment instruments and screening items should be included in the ACAP National Training Strategy for ACAT Assessors.

8 References

- Abbey JA, Piller N, De Billis A, Esterman A, Parker D, Giles L and Lowcay B (2004) *The Abbey Pain Scale: A 1-Minute Numerical Indicator for People with End-Stage Dementia*. International Journal of Palliative Nursing. Vol. 10, pp. 6-13.
- Alexopoulos GS, Abrams RC, Young RC and Shamoian CA (1988) *Cornell Scale for Depression in Dementia*. Biological Psychiatry. Vol. 23, pp. 271-84.
- Almeida OP and Almeida SA (1999) *Short versions of the geriatric depression scale: a study of their validity for the diagnosis of a major depressive disorder according to ICD-10 and DSM IV*. Int. J Geriatr Psychiatry. Vol. 14, pp. 858-865.
- American Geriatrics Society, British Geriatrics Society and the American Academy of Orthopaedic Surgeons Panel on Falls Prevention (2001) *Guidelines for the Prevention of Falls in Older Persons*. JAGS. Vol. 49, pp. 664-672.
- Andrews G and Slade T (2001) *Interpreting scores on the Kessler Psychological Distress Scale (K10)*. Australian and New Zealand Journal of Public Health. Vol. 25, pp. 494-497.
- Applied Aged Care Solutions (2010) *Key developments of the Australian Community Care Needs Assessment and Carer Eligibility Needs Assessment to progress towards a nationally consistent assessment process: Lessons learnt and recommendations*. AACCS.
- Australian Bureau of Statistics (1998) *Mental Health and Wellbeing: Profile of Adults, Australia 1997*. ABS Catalogue No. 4326
- Australian Bureau of Statistics (1997) *1995 National Health Survey: SF-36 Population Norms*. Australia. Cat No 4399.0. ABS, Canberra.
- Australian Pain Society (2005) *Pain in Residential Aged Care Facilities*. The Australian Pain Society, August 2005.
- Barker AL, Nitz JC, Low Choy NL and Haines T (2009) *Measuring fall risk and predicting who will fall: clinimetric properties of four fall risk assessment tools fro residential aged care*. J Gerontol A Biol Sci Med Sci. Vol. 64, pp. 916-924.
- Berwick DM, Murphy JM, Goldman PA, et al. (1991) *Performance of a Five-Item Mental Health Screening Test*. Medical Care. Vol. 29, pp. 169-176.
- Bot SDM, Terwee CB, van der Windt DAWM, Bouter LM, Dekker J and de Vet HCW (2004) *Clinimetric evaluation of shoulder disability questionnaires: A systematic review of the literature*. Ann Rheum Dis. Vol. 63, pp. 355-341.
- Bowling A (2001) *Measuring Health: A Review of Quality of Life Measurement Scales*. 2nd ed. Buckingham, Open University Press.
- Bowling A (2005) *Measuring Health: a review of quality of life measurement scales*. 3rd ed. Open University Press, Berkshire, England.
- Brink TL, Yesavage JA, Lum O, et al. (1982) *Screening tests for geriatric depression*. Clinical Gerontologist. Vol. 1, pp.37-43.
- Burns A, Lawlor B and Craig S (2004) *Assessment scales in old age psychiatry*. 2nd ed. Taylor & Francis, London.

- Cattaneo D, Regola A and Meotti M (2006) *Validity of six balance disorders scales in persons with multiple sclerosis*. Disability and Rehabilitation. Vol. 28, pp. 789-795.
- Centre for Health Service Development (2010) *Asthma management Program: First Evaluation Progress Report*, University of Wollongong.
- Chalmers JM, King PL, Spencer AJ, Wright FAC and Carter KD (2005) *The Oral Health Assessment Tool – Validity and reliability*. Australian Dental Journal. Vol. 50, pp. 191-199.
- Cleeland CS (1991) *Pain assessment: global use of the Brief Pain Inventory*. Ann Acad Med Singapore. Vol. 23, pp. 129-138.
- Cleeland CS (1989) Measurement of pain by subjective report. In Chapman CR and Loeser JD (Eds). *Issues in pain measurement*. Raven Press. New York.
- Collin C, Wade DT, Davis S, et al. (1988) *The Barthel ADL Index: A reliability study*. International Disability Studies. Vol. 10, pp. 61-63.
- Communio (2007) *National ACAT Review: Final Report*. Commonwealth Department of Health and Ageing, Canberra.
- Community Care Access Support System (2008) *Community Care Access Support System Data Dictionary*. Applied Aged Care Solutions, Victoria.
- Council on the Ageing, NSW (COTA NSW) (2003) (n.d.) *Social Isolation Draft Policy Position*. Council on the Ageing (NSW) Inc, Sydney.
- Cromwell D, Eagar K and Poulos R (2003) *The performance of an instrumental activities of daily living scale in screening for cognitive impairment in elderly community residents*. Journal of Clinical Epidemiology. Vol. 56, pp.131-137.
- Department of Health and Ageing (2006) *Aged Care Assessment and Approval Guidelines*. Australian Government, Canberra.
- Eagar K, Owen A, Cromwell D, et al. (2001) *Towards a national measure of functional dependency for home and community care services in Australia - Stage 1 Report of the HACC Dependency Data Items Project*. Centre for Health Service Development, University of Wollongong.
- Eagar K, Owen A, Green J, et al. (2002) *A National Measure of Functional Dependency for Home and Community Care Services in Australia*. Aged and Community Care Service Development and Evaluation Reports, Commonwealth Department of Health and Ageing, Canberra.
- Eagar K, Owen A, Marosszeky N, et al. (2006) *Towards a measure of function for home and community care services in Australia: Part 1 - Development of a Standard National Approach*. Australian Journal of Primary Health. Vol. 12, pp. 73-81.
- Eagar K, Green G, Gordon R, Owen A, Masso M and Williams K (2006) *Functional Assessment to Predict Capacity for Work in a Population of School Leavers with Disabilities*. International Journal of Disability, Development and Education. Vol. 53, pp. 331-349.
- Eagar K, Green J and Owen A (2010) *The NSW Post School Programs Eligibility Assessment: a guide to functional assessments in 2010*. Centre for Health Service Development, University of Wollongong.
- Ferrell BA, Ferrel BR and Rivera LJ (1995) *Pain in cognitively impaired nursing home patients*. J Pain Symptom Manage. Vol. 10, pp. 591-598.

- Folstein M, Folstein S and McHugh P (1975) 'Mini-Mental State': a practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatric Research. Vol. 12, pp. 189-198.
- Fillenbaum GG and Smyer MA (1981) *The development, validity and reliability of the OARS Multidimensional Functional Assessment Questionnaire*. J Gerontol. Vol. 36, pp. 428-434.
- Gibson SJ, Scherer SC and Goucke CR (2004) *Preliminary field testing and preparations for implementation of Australian Pain Society and Australian Pain Relief Association pain management guidelines for residential care*. November 2004.
- Green J, Eagar K, Owen A, et al. (2006) *Towards a measure of function for home and community care services in Australia: Part 2 - Evaluation of the Screening Tool and Assessment Instruments*. Australian Journal of Primary Health. Vol. 12, pp. 82-90.
- Gupta A (2008) Measurement scales used in elderly care. Radcliffe Publishing, Oxford UK.
- Hawthorne G, Sansoni J, Hayes LM, Marosszeky N and Sansoni E (2006) *Measuring Patient Satisfaction with Incontinence Treatment (Final Report)*. Centre for Health Service Development, University of Wollongong and the Department of Psychiatry, University of Melbourne.
- Hawthorne G (2006) *Measuring incontinence in Australia*. Department of Health and Ageing, Canberra.
- Hays RD, Sherbourne CD and Mazel RM (1993) *The RAND 36 Item Health Survey 1.0*. Health Economics. Vol. 2, pp. 217-227.
- Herr K and Garland L (2001) *Assessment and Measurement of Pain in Older Adults*. Clinics in Geriatric Medicine. Vol. 17, 457-478.
- InterRAI (2006) *InterRAI-Home Care Assessment*. Victorian Department of Human Services, Victoria.
- Isella V, Villa ML and Appollonio IM (2002) *Screening and quantification of depression in mild-to-moderate dementia through the GDS short forms*. Clinical Gerontologist. Vol. 24, pp.115-125.
- Jorm AF (2004) *The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): A review*. International Psychogeriatrics. Vol. 16, pp. 275-293.
- Kalra L and Crome P (1993) *The role of prognostic scores in targeting stroke rehabilitation in elderly patients*. J Am Geriatr Soc. Vol. 41 pp. 396-400.
- Kelly TM, Donovan JE, Kinnane JM and Taylor DMCD (2002) *A comparison of alcohol screening instruments among under-age drinkers treated in emergency departments*. Alcohol and Alcoholism. Vol. 37, pp. 444-450.
- Kempen GI, Yardley L, van Haastregt JC, et al. (2008) *The Short FES-I: a shortened version of the falls efficacy scale-international to assess fear of falling*. Age and Ageing. Vol. 37 pp. 45-50.
- Kempen GIJM, Todd CJ, van Haastregt JCM, et al. (2007) *Cross-cultural validation of the Falls Efficacy International (FES-I) in older people: Results from Germany, the Netherlands and the UK were satisfactory*. Disabil Rehabil. Vol. 29 pp. 155-162.
- Kessler R, Andrews G, Colpe L, et al. (2002) *Short screening scales to monitor population prevalences and trends in non-specific psychological distress*. Psychological Medicine. Vol. 32, pp. 959-976.

- Korner A, Lauritzen L, Abelson K, Gulmann N, et al. (2006) *The Geriatric Depression Scale and the Cornell Scale for Depression in Dementia. A validity study.* Nordic Journal of Psychiatry. Vol. 60, pp. 360-264.
- Langley LK (2004) *Cognitive Assessment of Older Adults (Chapter 4)*. In Kane RL, Kane RA, (Eds.) (2004). Assessing older persons: measures, meaning and practical applications. Oxford, University Press.
- Lawton MP and Brody EM (1969) *Assessment of older people: self maintaining and instrumental activities of daily living.* Gerontologist. Vol. 9, pp.179-186.
- Lim PPJ, Ng LL, Chiam PK, Ong PS, et al. (2000) *Validation and comparison of three brief depression scales in an elderly Chinese population.* Int. J. Geriatr Psychiatry. Vol. 15, pp. 824-830.
- Lindsay R, James EL and Kippen S (2004) *The Timed Up and Go Test: Unable to predict falls on the acute medical ward.* Australian Journal of Physiotherapy. Vol. 50, pp. 249-251.
- LoGiudice D, Smith K, Thomas J, et al. (2006) *Kimberley Indigenous Cognitive Assessment tool (KICA): Development of a cognitive assessment tool for older indigenous Australians.* International Psychogeriatrics. Vol. 18, pp. 269-280.
- Lubben J and Gironde M (2003) *Centrality of social ties to the health and well-being of older adults*. In Berkman, B, Harootyan L. (Eds.) (2003) Social Work and Health Care in an Aging Society. Springer Publishing Company.
- Lubben J and Gironde M (2004) *Measuring social networks and assessing their benefits*. In Phillipson C, Allan G and Morgan D (Eds.) (2004) Social networks and social exclusion: sociological and policy perspectives. Ashgate Publishing Limited, Hant, England.
- Lubben J, Blozik E, et al. (2006) *Performance of an abbreviated version of the Lubben Social Network Scale among three European community dwelling older adult populations.* The Gerontologist. Vol. 46, pp. 503-513.
- MacGivney SA, Mulvihill M and Taylor B (1994) *Validating the GDS depression screen in the nursing home.* J Am Geriatr Soc. Vol. 42, pp. 490-492.
- Mahoney J, Drink TJK, Abler R, Gunter-Hunter G, Matthews C, et al. (1994) *Screening for depression: Single question versus GDS.* JAGS. Vol. 42, pp. 1006-1008.
- Mahoney FI and Barthel DW (1965) *Functional evaluation: the Barthel Index.* Maryland State Medical Journal. Vol. 14, pp. 61-65.
- Marosszeky N (2007) *The Geriatric Depression Scale: A Review*. In Sansoni J, Marosszeky N, Jeon YH, et al. (2008) Dementia Outcomes Measurement Suite (DOMS) Project: Final Report. Centre for Health Service Development.
- McCallum J, Shadbolt B and Wang D (1994) *Self-rated health and survival: a 7-year follow-up study of Australian elderly.* American Journal of Public Health. Vol. 84, pp. 1100-1105.
- McDowell I (2006) *Measuring Health: A Guide to Rating Scales and Questionnaires (3rd ed.)*. Oxford University Press, Oxford.
- Medical Outcomes Trust (1994) *SF-36 Standard English (Australia/New Zealand) Version 1*. Medical Outcomes Trust.

Mokkink LB, Terwee CB, Knol DL, Stratford PW, Alonso J, Patrick DL, et al. (2006) *Protocol of the COSMIN study: Consensus-based Standards for the selection of health Measurement INstruments*. BMC Medical Research Methodology. Vol. 6.

Molloy DW, Alemayehu E and Roberts R (1991) *Reliability of a Standardised Mini-Mental State Examination compared with the traditional Mini-Mental State Examination*. American Journal of Psychiatry. Vol. 148, pp. 102-105.

Morris JM, Fries BE, Bernabei R, Steel K, et al. (2009) *InterRAI Home Care (HC) Assessment Form and User's manual V9.1*. Washington DC, interRAI.

NHMRC (2009) *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*. Commonwealth of Australia, Canberra.

NHMRC (2001) *Australian Alcohol Guidelines. Health Risks and Benefits*. Commonwealth of Australia, Canberra.

Nordin E, Lindelof N, Rosendahl E, Jensen J and Lundin-Olsson L (2008) *Prognostic validity of the Timed Up-and-Go test, a modified Get-Up-and-Go test, staff's global judgement and fall history in evaluating fall risk in residential care facilities*. Age and Ageing. Vol. 37, pp. 442-448.

NSW Health (2006) *New South Wales Population Health Survey: 2006 Report on Adult Health*. NSW Health. Centre for Epidemiology and Research, NSW Dept. of Health.

Owen A, Poulos R and Eagar K (2001) *Using the evidence to develop best practice models for identifying initial primary and community care needs*. Centre for Health Service Development, University of Wollongong.

Pangman VC, Sloan J and Guse L (2000) *An examination of psychometric properties of the mini-mental state examination and the standardized mini-mental state examination: implications for clinical practice*. Applied Nursing Research. Vol. 13, pp. 209-213.

Pearson (2004) *Assessment of Function in Older Adults*. In Kane RL and Kane RA (Eds.) (2004) Assessing older persons: measures, meaning and practical applications. Oxford University Press, USA.

Peninsula Health Falls Prevention Service (1999) *Falls Risk Assessment Tool (FRAT)*. Victorian Department of Human Services. Available at www.health.vic.gov.au/aged_care/maintaining/falls/providers/rac/plans_frat.htm

Rubenstein LZ, Harker JO, Salva A, Guigoz Y and Vellas B (2001) *Screening for undernutrition in geriatric practice: Developing the Short Form Mini Nutritional Assessment (MNA-SF)*. J Geront. Vol. 56, pp. 366-377.

Ruggiero C, Mariani T, Gugliotta R, et al. (2009) *Validation of the Italian version of the falls efficacy scale international (FES-I) and the short FES-I in community-dwelling older persons*. Arch Gerontol Geriatr. Vol. 49, pp. 211-219.

Sainsbury A, Seebas G, Bansal A and Young J (2000) *Reliability of the Barthel Index when used with older people*. Vol. 34, pp. 228-232.

Samsa P, et al. (2007) *The Australian Community Care Needs Assessment (ACCNA); towards a national standard*. Centre for Health Service Development, University of Wollongong.

Samsa P, Owen A and Eagar K, et al. (2008) *Ongoing Needs Identification in Community Care: Why Use the Access Points Screening and Referral Tools – the ONI-N Evidence and Explanations*. Centre for Health Service Development, University of Wollongong.

Sansoni J, Marosszeky N, Jeon YH, et al. (2008) *Dementia Outcomes Measurement Suite (DOMS) Project: Final Report*. Centre for Health Service Development.

Sansoni J, Marosszeky N and Sansoni E (2009) *A Framework for Selecting Tools for ACAT Assessment*. Centre for Health Service Development, University of Wollongong.

Sansoni J, Marosszeky N and Sansoni E (2010) *Draft Report: Effective Assessment of Social Isolation*. Centre for Health Service Development, University of Wollongong (in press).

Sansoni J, Marosszeky N Sansoni E and Hawthorne G (2006) *Refining Continence Measurement Tools (Final Report)*. Centre for Health Service Development, University of Wollongong and the Department of Psychiatry, University of Melbourne.

Sansoni J and Marosszeky N (2009) *The clinical validation of the revised continence tools*. (Presentation), [Continence Foundation of Australia Conference](#). Adelaide. November 4-7.

Sansoni J and Marosszeky N (2006) *Australian Health Outcomes Collaboration Instrument Review Sheet (Revised)*. Centre for Health Service Development, University of Wollongong.

Sanson-Fisher RW and Perkins JJ (1998) *Adaptation and validation of the SF-36 Health Survey for use in Australia*. [J. Clin. Epidemiol.](#) Vol. 51, pp. 961-967.

Saunders JB, Aasland OG, Babor TF, de la Fuente JR and Grant M (1993) *Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption –II*. [Addiction](#). Vol. 88, pp. 791-804.

Scott S, Votova K, Scanlan A and Close J (2007) *Multifactorial and functional mobility assessment tools for fall risk among older adults in community, home-support, long term and acute care settings*. [Age and Ageing](#). Vol. 36, pp. 130-139.

Shadbolt B, McCallum J and Singh M (1997) *Health Outcomes by Self-report: Validity of the SF-36 among Australian Hospital Patients*. Report for the ACT Department of Health and Community Care.

Shadbolt, et al. (1996) *First Report from the ACT Continuum of Care Project*. Report for the ACT Department of Health and Community Care.

Shah S, Vanclay F and Cooper B (1989) Improving the sensitivity of the Barthel Index for stroke rehabilitation. [Journal of Clinical Epidemiology](#). Vol. 42, pp. 703-709.

Shah AK, Phongsathorn V, George C, Bielawska C and Kattona C (1992) *Psychiatric morbidity among continuing care geriatric inpatients*. [Int. J Geriatr Psychiatry](#). Vol. 7, pp. 517-525.

Shah AK, Phongsathorn V, Bielawska C and Kattona C (1996) *Screening for depression among geriatric inpatients with short versions of the geriatric depression scale*. [Int. J Geriatr Psychiatry](#). Vol. 11, pp. 915-918.

Shah A, Herbert R, Lewis S, Mahendran R, Platt J and Bhattacharyya B (1997) *Screening for depression among acutely ill geriatric patients with a short geriatric depression scale*. [Age and Ageing](#). Vol. 26, pp. 217-221.

Slade GD (2007) *Oral Health for Older People: Evaluation of the South Australian Dental Service project*. Canberra.

- Smith K, Flicker L, Dwyer A, et al. (2009) *Assessing cognitive impairment in Indigenous Australians: Re-evaluation of the Kimberley Indigenous Cognitive Assessment in Western Australia and the Northern Territory*. Australian Psychologist. Vol. 44, pp. 54-61.
- Steed L, Boldy D, Grenade L and Iredell H (2007) *The demographics of loneliness among older people in Perth, Western Australia*. Australasian Journal on Ageing. Vol. 26, pp. 81-86.
- Stewart AL, Sherbourne CD, Hays RD, Wells KB, et al. (1992) *Summary and discussion of MOS measures*. In A. L Stewart and J.E. Ware (Eds.) Measuring function and well-being: The Medical Outcomes Study approach (pp. 345-372). Duke University Press. Durham, NC.
- Stevenson M, Smith K and Strivens E (2008) *Indigenous Cognitive Assessment : Validation of the KICA-Cog in Far North Queensland*. Cairns: Queensland Government, Queensland Health.
- Stevemuer T, Owen A and Eagar K (2004) *A Priority Rating System for the NSW Home Care Service: Data Driven Solutions*. Centre for Health Service Development, University of Wollongong.
- Stevemuer TL, Owen A, Williams K and Masso M (2007) *Priority rating for community care*. Australian Health Review. Vol. 31, pp. 592-602.
- Storey JE, Rowland JT, Basic D, et al. (2004) *The Rowland Universal Dementia Assessment Scale (RUDAS): a multicultural cognitive assessment scale*. International Psychogeriatrics. Vol. 16, pp. 13-31.
- Streiner D and Norman G (2006) Health Measurement Scales: A Practical Guide to their Development and Use. Oxford Medical Publications, Oxford.
- Sulter G, Steen G and DeKeyser J (1999) *Use of the Barthel Index and Modified Rankin Scale in Acute Stroke Trials*. Stroke. Vol. 30, pp. 1538-1541.
- Teng EL and Chui HC (1987) *The Modified Mini-Mental State (3MS) Examination*. Journal of Clinical Psychiatry. Vol. 48, pp. 314-318.
- van Marwijk HW, Wallace P, de Bock GH, et al. (1995) *Evaluation of the feasibility, reliability and diagnostic value of shortened versions of the geriatric depression scale*. British Journal of General Practice. Vol. 45, pp. 195-199.
- Vertesi A, Lever JA, Molloy DW, et al. (2001) *Standardized Mini-Mental State Examination. Use and interpretation*. Canadian Family Physician. Vol. 47, pp. 2018-2023.
- Victor C, Grenade L and Boldy D (2005) *Measuring Loneliness in later life: A comparison of differing measures*. Reviews in Clinical Gerontology. Vol. 15, pp. 63-70.
- Viet CT and Ware JE (1983) *The structure of psychological distress and well-being in general populations*. J Consult Clin Psychol. Vol. 51, pp. 730-742.
- Vision 2020 Australia (2010) *Expert Clinical Reference Group – ACAT Submission, Vision 2020 Australia*.
- Ware JE, Snow MS, Kosinski M and Gandek B. (1993) *SF-36 Health Survey: Manual and Interpretation Guide*. The Health Institute, New England Medical Center, Boston, MA.
- Ware JE, Manning WG, Duan N, et al. (1984) *Health status and the use of ambulatory mental health services*. Am Psychol. Vol. 39, pp. 1090-1100.
- Ware JE, Kosinski M and Dewey JE (2001) *How to Score Version Two of the SF-36 Health Survey (2nd Ed.)* QualityMetric Incorporated, Lincoln RI.

Ware JE, Kosinski MA, Dewey J and Gandek B (2001b) *How to Score and Interpret Single Item Health Status Measures: A Manual for Users of the SF-8 Health Survey* (With a supplement on the SF-6 Health Survey) Lincoln, RI: QualityMetric Incorporated.

Watson LC and Pignone MP (2003) *Screening accuracy for late-life depression in primary care: a systematic review*. Journal of Family Practice. Vol. 52, pp. 956-964.

Yamazaki S, Fukuhara S and Green J (2005) *Usefulness of five-item and three-item Mental Health Inventories to screen for depressive symptoms in the general population in Japan*. Health and Quality of Life Outcomes. Vol. 3. pp. 48.

Yardley L, Todd C, Beyer N, et al. (2005) *Development and initial validation of the Falls Efficacy Scale International (FES-I)*. Age Ageing. Vol. 34, pp. 614-619.

Yesavage JA, Brink TL, Rose TL, et al. (1983) *Development and validation of a geriatric depression screening scale: a preliminary report*. Journal of Psychiatric Research. Vol. 17, pp. 37-49.

Zijlstra G, van Haagstregt J, van Eijk J, van Rossum E, Stalenhoef P and Kempen G (2007) *Prevalence and correlates of fear of falling, and associated avoidance of activity in the general population of community-living older people*. Age and Ageing. Vol. 36, pp. 304-309.

Attachment 1: The Evaluation Framework

The Evaluation Framework

The evaluation framework (Sansoni et al., 2009) follows the framework for evaluation undertaken by the Dementia Outcomes Measurement Suite (DOMS; Sansoni et al., 2008), which is outlined below. For the current project a number of minor adjustments to this framework have been made and these are identified, where appropriate, below.

Identifying relevant instruments

For the DOMS project (Sansoni et al., 2008) an initial overall literature search was undertaken (MEDLINE, PsycINFO) on twenty key terms (e.g. dementia, cognition, memory, function, Quality of Life etc.). The major texts in the field were examined which included psychometric texts containing instrument reviews (e.g. McDowell, 2006; Bowling, 2001, 2005) as well as those containing instrument reviews applicable for Dementia and assessment of the elderly (e.g. Burns et al., 2004; Kane and Kane, 2000; Lezak, 2004; McKeith et al., 1999). This process identified a list of instrument names and then searches were undertaken on all measures identified.

A database was then developed which provided comparative data for instruments for each domain/category (Associated Symptoms, Cognitive, Comprehensive, Dementia Staging and Description, Function, Health Related Quality of Life, Miscellaneous, Neuropsychological, Satisfaction, Social and Utility Measures). This database included 844 named instruments. A CD-Rom was developed for each domain/category of instruments (e.g. dementia staging and description, cognition, health related quality of life etc.) containing relevant papers and abstracts for each of the review teams.

An impact sheet was then developed for consideration by the review teams and the DOMS-Expert Measurement Group (DOMS-EMG). This considered MEDLINE, text and web impacts, presence in instrument databases (e.g. PROQOLID) and its use in clinical practice. The latter was based on National Expert Panel (DOMS-NEP) feedback, field surveys and clinical feedback. This process usually identified the leading twelve or so instruments for consideration in each category.

In this project these activities will not be repeated as any further instruments that may need to be reviewed, that are specific to ACAT, have already been identified by the ACAP ECRG and an ACAP survey on the use of instruments.

Additional Selection Criteria

In the DOMS project, further selection criteria were then applied to reduce this to the leading 5-6 instruments in each domain/category within the DOMS project. However, the additional criteria below have been modified slightly for the current project to change the reference group from dementia to ageing:

- Whether there is a copy of the instrument and the original article concerning its development available for review.
- The number of citations found. In the case of new instruments some care was taken to assess this criterion as it was considered that recently developed instruments may not have a high citation rate. However, for instruments developed more than 5 years previously, a low citation rate might indicate limited adoption by the field.
- The amount and range of the published psychometric evidence.
- Whether the instrument is used in clinical practice (evidence from the literature and data from NEP, ACAP and other surveys).
- The availability of normative and clinical reference data.
- Administration time (generally 20 minutes or less) where a shorter administration time would be preferred. It was noted that as a number of instruments assessing different aspects (e.g.

function, cognition) will need to be utilised, lengthy instruments that may be more appropriate for detailed follow-up assessment may not be appropriate for use in routine or initial assessment or across the range of practice settings.

- Whether the instrument is applicable for the target group of the elderly including both those dwelling in the community and those dwelling in both high and low level residential care facilities. Generally, preference would be given to measures applicable across a range of settings and stages related to the ageing process and associated conditions.
- Proprietary considerations (e.g. prohibitive cost).
- Applicability for use in routine care. Instruments would be preferred if they did not require specialist skills for administration or if extensive training in their use was not required (e.g. as for many neuropsychological/medical assessments).

Once the shortlist of contender instruments had been reduced to 5-6 measures for each category then a decision summary sheet was developed justifying the selection or non-selection of contender instruments. Further searches were then undertaken for the selected instruments using other databases (e.g. CINAHL, Cochrane Library etc) and the comprehensive reviews of these instruments commenced. Similarly in the current project, once the identifies an instrument for comprehensive review the instrument will be examined with reference to the above criteria and then further literature searches will be undertaken concerning this instrument prior to review.

All instrument reviews make use of the Australian Health Outcomes Collaboration instrument review sheet (Sansoni and Marosszky, 2006) which has been modified for this project (refer Table 3 below). The review sheet has been adjusted for the target group of this project (e.g. elderly persons vs. those with dementia) and contains the following information:

- Author, publication information, availability
- Cost
- Training requirements
- Purpose of the instrument and who it was developed for
- Administration time
- Structure of the instrument
- Scoring
- Applications and availability of normative and clinical reference data
- Carer/Patient use of the instrument
- Psychometric criteria – reliability, validity, responsiveness
- Cultural applicability and cultural adaptations
- Gender and age appropriateness

With all instruments consideration will be given to the following aspects:

- The ageing process
- Purpose of the instrument (screening, follow up or more in-depth assessment, outcomes monitoring and the evaluation of interventions)
- Self-reporting and proxy reporting
- Respondent and staff burden
- Appropriateness for Culturally and Linguistically Diverse (CALD) and Aboriginal and Torres Strait Islander groups
- Appropriateness for a range of settings (e.g. community and residential care)

**Table 3 Australian Health Outcomes Collaboration Instrument Review Sheet 2009
(ACAP ECRG Revision)**

Title:

Abbreviations:

Author(s) Name:

Author(s) Address:

Supplied by:

Cost:

Training requirements:

Purpose:

Administration time:

Instrument Type:

Structure:

Scoring:

Developed for:

Normative Data:

Clinical/Reference Data:

Applications:

Carer and/or

Patient Use of Instrument:

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Alpha >0.70 <input type="checkbox"/> Marginal or inadequate internal consistency (<0.70) <input type="checkbox"/> No information found on internal consistency 	
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>		<ul style="list-style-type: none"> <input type="checkbox"/> ICC >.70 Time intervals and confidence intervals reported <input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70 <input type="checkbox"/> No information found on test-retest reliability 	
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Agreement reported and adequate <input type="checkbox"/> Inadequate inter-rater agreement <input type="checkbox"/> No information provided <input type="checkbox"/> Not applicable 	

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Patients/target groups and experts were involved during item selection and/or item reduction <input type="checkbox"/> Patients/target groups were consulted for reading and comprehension <input type="checkbox"/> No patient/target group involvement <input type="checkbox"/> No information found on content validity <input type="checkbox"/> There is an adequate coverage of relevant domains <input type="checkbox"/> There is limited coverage of relevant domains 	
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used <input type="checkbox"/> Limited construct validity information reported <input type="checkbox"/> Inadequate or no information on construct validity reported 	
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>		<ul style="list-style-type: none"> <input type="checkbox"/> No evidence provided/failed a test of dimensionality <input type="checkbox"/> Some evidence provided to support internal structure <input type="checkbox"/> Substantial evidence provided to support internal structure 	
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Correlations with other measures are reported <input type="checkbox"/> Correlations not reported 	
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Scale differentiates between relevant categories of respondents <input type="checkbox"/> No information provided on discriminant validity 	

<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Comparison made to criterion measures <input type="checkbox"/> Limited comparison with criterion measures provided <input type="checkbox"/> No comparison with criterion measures provided 	
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Authors provide 2 or more types of information on interpretability <input type="checkbox"/> Authors provide limited information to assist with interpretability <input type="checkbox"/> No information provided 	

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects were detected <input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score <input type="checkbox"/> No or limited information provided on floor and ceiling effects 	
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Hypotheses were formulated and results were in agreement <input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard) <input type="checkbox"/> No information on sensitivity to change was 	

		provided <input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful <input type="checkbox"/> MCID – No information was provided.	
--	--	--	--

Cultural Applicability and Cultural Adaptations:

Gender Appropriateness:

Age Appropriateness:

Summary:

Reporter:

Date of report:

References

Adequacy checks were modified from Bot et al. (2004) and represent world’s best practice for the selection of health measurement instruments (see Mokkink et al. 2006).

*Bot, S. D. M., Terwee, C. B., van der Windt, D. A. W. M., Bouter, L. M., Dekker, J., & de Vet, H. C. W. (2004). Clinimetric evaluation of shoulder disability questionnaires: A systematic review of the literature. *Ann Rheum Dis*, 63, 355-341.*

*Mokkink, L. B., Terwee, C. B., Knol, D. L., Stratford, P. W., Alonso, J., Patrick, D. L. et al. (2006). Protocol of the COSMIN study: COnsensus-based Standards for the selection of health Measurement Instruments. *BMC Medical Research Methodology*, 6.*

**** This review sheet is an ACAP ECRG revision of the *Australian Health Outcomes Collaboration Instrument Review Sheet 2009*. The instrument review sheet was originally developed by Sansoni J, Marosszeky N (2006) *Australian Health Outcomes Collaboration Instrument Review Sheet (Revised)*. Centre for Health Service Development, University of Wollongong. ****

Once the review of any instrument has been completed it will be scored according to the Table of Criteria and Weights for Instrument Ranking (refer Table 4) as this will enable instruments in the same category of assessment to be compared on common criteria. Instruments in the same category will then be compared on the Instrument Comparison Table 2009 (refer Table 5).

Table 4 Table of Criteria and Weights for Instrument Ranking**Criteria and weights used to assess instruments**

Instrument Name Total Score =

Evaluation Criteria	Scoring system	Score	Weight	Weighted Score
Theoretical and empirical basis for the design and development of the instrument and its items	1 = no or inadequate information concerning instrument design and development is provided 2 = limited information concerning instrument design and development is provided 3 = ample information on instrument design and development is provided		3	
Availability of comparison data	1 = minimal or no comparison data available 2 = some international comparison data available 3 = Australian and international comparison data available including normative data and clinical reference data		3	
Length/feasibility of instrument for inclusion in battery	1 = long instrument, 25+ items 2 = medium length instrument, 15-25 items 3 = short instrument, less than 15 items		2	
Complexity of administration (for clinician use); and cognitive burden (for self report or proxy instruments)	1 = demanding to understand or administer 2 = some difficulties to understand or administer 3 = easy to understand and administer		2	
Cultural Appropriateness (ease of use with an interpreter, client literacy, CALD criteria including Indigenous Australians)	1 = not appropriate for use by CALD or illiterate clients, or with an interpreter 2 = limited appropriateness for use by CALD or illiterate clients and interpreters 3 = appropriate for use by CALD or illiterate clients and interpreters		1	
Ease of obtaining score by the evaluator	1 = scoring complex and requires computer 2 = can be scored without computer but time consuming 3 = scoring easy and does not require computer		2	
Sensitivity to the disease/condition specified	1 = not known to be sensitive to the disease or condition specified 2 = sensitive to the disease or condition specified 3 = good sensitivity to the disease or condition specified		3	
Reliability evidence available	1 = little published evidence identified 2 = evidence suggests moderate reliability 3 = evidence suggests good reliability		3	
Validity evidence available	1 = little published validity evidence identified 2 = evidence suggests moderate validity 3 = evidence suggests good validity		3	
Cost of the instrument	1 = costs charged for using instrument 2 = costs for commercial use/training costs 3 = instrument available free of charge		2	
Cost of instrument administration	1 = professional 2 = paraprofessional/ staff member 3 = self complete		2	

The instrument will be given a score against each criterion and this is multiplied by the weight for this criterion. The resulting weighted score for each criterion is then added to form a total score for

each instrument. The weights suggested are those used and agreed by the Expert Measurement Group for the DOMS project.

For each category of instruments a comparative table of scores for the instruments is then produced (refer Table 5) and it is on this basis the recommendations for instruments will be formed.

Table 5 *Sample Instrument Comparison Table 2009*

Criteria	Weight	Instrument					
		AA	AB	AC	AD	AE	AF
Theoretical basis of instrument	3	3	2	2	1	1	1
Availability of comparison data	3	3	2	1	1	1	1
Length/feasibility of instrument for inclusion in battery	2	2	1	3	3	3	2
Complexity of administration / cognitive burden	2	2	2	3	2	3	2
Cultural Appropriateness	1	2	3	1	3	1	3
Ease of obtaining score	2	3	3	3	3	3	3
Sensitivity to AGEING	3	3	3	2	2	2	2
Reliability evidence	3	3	3	3	3	2	2
Validity evidence	3	3	3	3	3	3	1
Cost of the instrument	2	3	3	3	1	2	3
Cost of instrument administration	2	2	1	1	2	2	2
Weighted Total (example)		71	62	60	55	54	48

It is noted that instruments previously reviewed using the DOMS evaluation framework, will also need to be rescored on the Table of Criteria and Weights (refer Table 4) due to minor changes made to the criteria for this project (e.g. changing the reference group from dementia to ageing).

Attachment 2: Proposed Screening Items for ACAT Assessment

Note some screening items have some follow up components and where this occurs they are indented in that section.

General and Preliminary Items

Interpreter Required

This question should be asked at intake or when the ACAT assessment appointment is arranged

Assessor Rated: Is an interpreter required?

Yes
No

If 'yes' arrange for an interpreter.

Trigger for Carer Referral and Assessment

Are carer arrangements sustainable without additional services or support?

Yes
No

If 'no', refer the carer for an assessment for eligibility for other types of care services (eg. HACC services).

Self Rated Health Status

This question should be asked just prior to asking if the client has any diagnosed diseases or disorders

In general would you say your health is...?

Excellent
Very Good
Good
Fair
Poor

If the client reports 'fair' or 'poor' this would indicate the potential for poor health outcomes and the potential complexity or length of the assessment.

Physical Function: Screening Items

Falls

Have you had a fall in the past 12 months?

Yes
No

If 'yes' a referral for a falls assessment should be considered.

Are you afraid of falling?

- Never
- Almost Never
- Sometimes
- Often
- Very Often

If 'yes' a referral for a falls assessment should be considered.

Pain

In the past 4 weeks have you had more than mild pain or discomfort?

- Yes
- No

If 'yes' consider using the relevant pain assessment tool (Brief Pain Inventory, Residents Verbal Brief Pain Inventory or Abbey Pain Scale) and consider referral to General Practitioner for diagnosis and treatment.

Feeding and Swallowing

Do you have problems swallowing?

- Yes
- No

If 'yes' consider referral to General Practitioner.

Nutrition

Have you lost any weight without trying, or had other nutritional concerns, in the past 3 months?

- Yes
- No

If 'yes' consider referral for further health assessment.

Assessor Rated: Has the client had any nutritional concerns over the past 3 months (e.g. loss of appetite, reduced food or fluid intake, obviously underweight/ overweight, unintentional weight loss/gain, special diet)

- Yes _____ (specify concern)
- No
- Don't Know

If 'yes' consider referral for further health assessment.

Dental or Oral Health Concerns

Do you have any problems with your teeth, mouth or dentures?

- Yes
- No

If 'yes' consider a further assessment using four items from the South Australian Oral Health Referral Pad and consider referral to a dental practitioner.

Skin Condition

Do you currently have any major skin condition?

Yes

No

If 'yes' specify below:

- | | |
|--|--------------------------|
| a. Pressure ulcer | <input type="checkbox"/> |
| b. Other skin ulcer | <input type="checkbox"/> |
| c. Healing surgical wounds | <input type="checkbox"/> |
| d. Other skin tears, cuts or lesions | <input type="checkbox"/> |
| e. Other skin problems e.g. bruises, rashes, itching, eczema, etc. | <input type="checkbox"/> |

If any items are recorded and require treatment consider referral to General Practitioner.

Foot Condition

Do you have a foot problem that affects your ability to walk or move about?

Yes

No

If 'yes' consider referral to a relevant health professional.

Vision

Do you have difficulty with vision, even with glasses?

Yes

No

If 'yes' consider referral to an eye health professional.

Hearing

Do you have difficulty hearing, even if you use a hearing aid?

Yes

No

If 'yes' consider referral to a relevant health professional

Continence

[In addition to the bowel and bladder items in the Modified Barthel Index]

Do you have any other bowel or bladder problems (e.g. pain/difficulty in passing stool, frequent diarrhoea, increased need to urinate at night or frequent urination?)

Yes

No

If 'yes' consider assessment using the Revised Urinary Continence Scale or the Revised Faecal Incontinence Scale and referral to a continence assessment service

Sleep

Do you experience any difficulties with your sleep (e.g. difficulty falling asleep, fragmented sleep, insufficient sleep)?

Yes

No

If 'yes' consider referral to a General Practitioner.

Environmental Assessment

[For assessments conducted in a community setting].

Assessor Rated: Does the residential environment have any major safety and health risks?

Yes

No

Don't Know

If 'yes' consider referral to an Occupational Therapist

Lifestyle and Health Behaviours

Are you a current smoker?

Yes

No

If 'yes' consider referral to a Quit Smoking Program.

Is alcohol consumption causing a problem for this person?

Yes

No

Don't Know

If 'yes', specify problem:

Mobility problems

Confused at times

Inappropriate behaviour

Personal neglect

Dangerous driving

Nutritional concerns

If problems identified consider assessment using the AUDIT Scale and if dependency problem is confirmed, consider referral to a health professional or relevant counselling service.

Cognitive Function Screening Items

Decision Making Capability

Assessor rated: *Are there any concerns regarding the person's decision making capabilities*

- Yes (minor impairment/requires occasional supervision or assistance through to severe impairment)
 No (appropriate decisions are made; minor difficulty occurs only in new situations)
 Not sure

If 'yes'

Who assists the person in making health and lifestyle decisions?

- a. = No one
 b. = Significant Informal Assistance
 c. = Power of Attorney
 d. = Advance Health Directive
 e. = Person responsible or appointed guardian

If the answer is (a) or conflict is apparent concerning these issues, consider referral for specialist assessment.

Who assists the person in making financial decisions?

- a. = No one
 b. = Significant Informal Assistance
 c. = Power of Attorney
 d. = Formal financial manager or administrator
 e. = Person responsible or appointed guardian

If the answer is (a) or conflict is apparent concerning these issues, consider referral for specialist assessment.

Communication

Assessor Rated: *Does this person have difficulty in communicating with others?*

- Yes
 No

If 'yes' consider referral to a relevant health professional.

Behavioural and Psychological Screening Items

Depression

Over the past four weeks have you felt down or depressed more than half of the time?

- Yes
 No

If 'yes' or you suspect that the client may be depressed, consider assessment using the Geriatric Depression Scale -15 and then consider referral to a relevant health professional.

Behaviours of Concern and Delirium Items

The following questions should be asked of an informant.

Does (the person) have behavioural problems for example, aggression, agitation, wandering, socially inappropriate behaviour or sexual disinhibition?

Yes _____ (specify behaviour)
No

If yes, how frequently do these behaviours occur?

Occasionally
Regularly
Always

If 'yes' consider referral for medical assessment.

Has there been a sudden change in the person's mental state recently?

Yes
No

If 'yes' consider referral for an urgent medical review.

Social Function Screening Items

Loneliness and Help Availability

Would you say that you are often lonely?

Yes
No

If 'yes' explore the issues further and consider referral to relevant community support services.

During the past 4 weeks, was someone available to help you if you needed and wanted help?

Yes
No

If 'yes' explore the issues further and consider referral to relevant community support services.

Neglect/Abuse

Is there any indication that this person has been abused, mistreated, or neglected?

Yes
No

If 'yes' follow the local elder abuse protocol.

Recent Stressful Events

*Has the person experienced one or more major stressful life events over the past 3 months?
(These events could include a bereavement or severe illness/ injury of self/family/ friend,
separation from partner/family, major financial loss or being the victim of a crime).*

Yes _____ (specify event)
No

If 'yes' explore further and consider its contribution to the person's current presentation.

Attachment 3: Examples of Recommended Core Assessment Instruments

Caveat

Examples of the recommended tools are included in this Attachment. Prior to the implementation of the tools recommended in this report, permission would need to be obtained from the tool's authors.

Modified Barthel Index of Activities of Daily Living (with Collin Scoring)

Instructions: Choose the scoring point for the statement that most closely corresponds to the patient's current level of ability for each of the following 10 items. Record the actual, not potential, functioning. Information can be obtained from the patient's self-report, from a separate party who is familiar with the patient's abilities (such as a relative), or from observation. Refer to the Guidelines section on the following page for detailed information on scoring and interpretation.

The Barthel Index

Bowels

0 = incontinent (or needs to be given enemata)

1 = occasional accident (once/week)

2 = continent

Patient's Score:

Bladder

0 = incontinent, or catheterized and unable to manage

1 = occasional accident (max. once per 24 hours)

2 = continent (for over 7 days)

Patient's Score:

Grooming

0 = needs help with personal care

1 = independent face/hair/teeth/shaving (implements provided)

Patient's Score:

Toilet use

0 = dependent

1 = needs some help, but can do something alone

2 = independent (on and off, dressing, wiping)

Patient's Score:

Feeding

0 = unable

1 = needs help cutting, spreading butter, etc.

2 = independent (food provided within reach)

Patient's Score:

Transfer

0 = unable – no sitting balance

1 = major help (one or two people, physical), can sit

2 = minor help (verbal or physical)

3 = independent

Patient's Score:

Mobility

0 = immobile

1 = wheelchair independent, including corners, etc.

2 = walks with help of one person (verbal or physical)

3 = independent (but may use any aid, e.g., stick)

Patient's Score:

Dressing

0 = dependent

1 = needs help, but can do about half unaided

2 = independent (including buttons, zips, laces, etc.)

Patient's Score:

Stairs

0 = unable

1 = needs help (verbal, physical, carrying aid)

2 = independent up and down

Patient's Score:

Bathing

0 = dependent

1 = independent (or in shower)

Patient's Score:

Total Score:**Scoring:**

Sum the patient's scores for each item. Total possible scores range from 0 – 20, with lower scores indicating increased disability. If used to measure improvement after rehabilitation, changes of more than two points in the total score reflect a probable genuine change, and change on one item from fully dependent to independent is also likely to be reliable.

Sources:

- Collin C, Wade DT, Davies S, Horne V. The Barthel ADL Index: a reliability study. *Int Disabil Stud.* 1988;10(2):61-63.
- Mahoney FI, Barthel DW. Functional evaluation: the Barthel Index. *Md State Med J.* 1965;14:61-65.
- Wade DT, Collin C. The Barthel ADL Index: a standard measure of physical disability? *Int Disabil Stud.* 1988;10(2):64-67.

Guidelines for the Barthel Index of Activities of Daily Living**General**

- The Index should be used as a record of what a patient **does**, NOT as a record of what a patient **could do**.
- The main aim is to establish degree of independence from any help, physical or verbal, however minor and for whatever reason.
- The need for supervision renders the patient not independent.
- A patient's performance should be established using the best available evidence. Asking the patient, friends/relatives, and nurses will be the usual source, but direct observation and common sense are also important. However, direct testing is not needed.
- Usually the performance over the preceding 24 – 48 hours is important, but occasionally longer periods will be relevant.
- Unconscious patients should score '0' throughout, even if not yet incontinent.
- Middle categories imply that the patient supplies over 50% of the effort.
- Use of aids to be independent is allowed.

Bowels (preceding week)

- If needs enema from nurse, then 'incontinent.'
- 'Occasional' = once a week.

Bladder (preceding week)

- 'Occasional' = less than once a day.
- A catheterized patient who can completely manage the catheter alone is registered as 'continent.'

|

Grooming (preceding 24 – 48 hours)

- Refers to personal hygiene: doing teeth, fitting false teeth, doing hair, shaving, washing face. Implements can be provided by helper.

Toilet use

- Should be able to reach toilet/commode, undress sufficiently, clean self, dress, and leave.
- 'With help' = can wipe self and do some other of above.

Feeding

- Able to eat any normal food (not only soft food). Food cooked and served by others, but not cut up.
- 'Help' = food cut up, patient feeds self.

Transfer

- From bed to chair and back.
- 'Dependent' = NO sitting balance (unable to sit); two people to lift.
- 'Major help' = one strong/skilled, or two normal people. Can sit up.
- 'Minor help' = one person easily, OR needs any supervision for safety.

Mobility

- Refers to mobility about house or ward, indoors. May use aid. If in wheelchair, must negotiate corners/doors unaided.
- 'Help' = by one untrained person, including supervision/moral support.

Dressing

- Should be able to select and put on all clothes, which may be adapted.
- 'Half' = help with buttons, zips, etc. (*check!*), but can put on some garments alone.

Stairs

- Must carry any walking aid used to be independent.

Bathing

- Usually the most difficult activity.
- Must get in and out unsupervised, and wash self.
- Independent in shower = 'independent' if unsupervised/unaided.

Collin C, Wade DT, Davies S, Horne V. The Barthel ADL Index: a reliability study. *Int Disabil Stud.* 1988;10(2):61-63.

OARS-IADL Items

These are the Instrumental Activities of Daily Living items (IADL) items drawn from the Older American Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire (Duke University, 1975, Revised 1988)

Can you use the telephone ...

- 2: without help, including looking up numbers and dialling,
- 1: with some help (can answer phone or dial operator in an emergency, but need a special phone or help in getting the number or dialling),
- 0: or are you completely unable to use the telephone?
- : Not answered

Can you get to places out of walking distance ...

- 2: without help (can travel alone on buses, taxis, or drive your own car),
- 1: with some help (need someone to help you or go with you when travelling) or
- 0: are you unable to travel unless emergency arrangements are made for a specialized vehicle like an ambulance?
- : Not answered

Can you go shopping for groceries or clothes [assuming subject has transportation]...

- 2: without help (taking care of all shopping needs yourself, assuming you had transportation),
- 1: with some help (need someone to go with you on all shopping trips),
- 0: or are you completely unable to do any shopping?
- : Not answered

Can you prepare your own meals ...

- 2: without help (plan and cook full meals yourself),
- 1: with some help (can prepare some things but unable to cook full meals yourself), 0: or are you completely unable to prepare any meals?
- : Not answered

Can you do your housework ...

- 2: without help (can you scrub floors, etc.),
- 1: with some help (can do light housework but need help with heavy work),
- 0: or are you completely unable to do any housework?
- : Not answered

Can you take your own medicine ...

- 2: without help (in the right doses at the right time),
- 1: with some help (able to take medicine if someone prepares it for you and/or reminds you to take it),
- 0: or are you completely unable to take your medicines?
- : Not answered

Can you handle your own money ...

- 2: without help (write checks, pay bills, etc.),
- 1: with some help (manage day-to-day buying but need help with managing your chequebook and paying your bills),
- 0: or are you completely unable to handle money?
- : Not answered

Multidimensional Functional Assessment: the OARS methodology. A manual. 2nd ed. Durham, North Carolina: Duke University Center for the Study of Aging and Human Development, 1978

Fillenbaum GG and Smyer MA (1981) *The development, validity and reliability of the OARS Multidimensional Functional Assessment Questionnaire.* J Gerontol. Vol. 36, pp. 428-434.

Fillenbaum GC (1988) Multidimensional functional assessment of older adults: the Duke Older Americans Resources and Services procedures. Hillside, NJ: Lawrence Earlbaum Associates.

KICA-ADL:

I'd like to ask you questions about what *name* can do for himself / herself.

1. Can s/he still do her own work? (*paid and unpaid eg. cooking/cleaning/making fire*)
yes no don't know

2. Can s/he still go eg. fishing, play cards? (activities they enjoy)
yes no don't know

3. Can s/he look after his/her own money?
yes no don't know

4. Can s/he feed himself?
yes no don't know

5. Can s/he put on his/her clothes?
yes no don't know

6. Can s/he shower himself/ herself?
yes no don't know

7. Does s/he have trouble finding the toilet?
yes no don't know

8. Does s/he make gumbu (urine) in bed in the night?
yes no don't know

9. Does s/he make gumbu (urine) in trousers/dress in the daytime?
yes no don't know

10. Does s/he make gura (bowel motion) in his trousers/dress?
yes no don't know

Standardized Mini Mental State Examination (SMMSE)

Molloy DW, Alemayehu E, and Roberts R (1991) *Reliability of a Standardised Mini-Mental State Examination compared with the traditional Mini-Mental State Examination*. American Journal of Psychiatry. Vol. 148, pp. 102-105.

Standardized Mini Mental State Examination (SMMSE)

Directions for Administration of SMMSE

1. Before the questionnaire is administered, try to get the subject to sit down facing you. Assess the subject's ability to hear and understand very simple conversation, e.g. 'What is your name?' If the subject uses hearing or visual aids, provide these before starting.
2. Introduce yourself and try to get the subject's confidence. Before you commence, get the subject's permission to ask questions, e.g. 'Would it be all right to ask you some questions about your memory?' This helps to avoid catastrophic reactions.
3. Ask each question a maximum of three times. If the subject does not respond score 0.
4. If the subject answers incorrectly score 0. Do not hint, prompt or ask the question again, e.g. what year is this? 1952. Accept that answer do not ask the question again, hint or provide any physical clues such as head shaking, etc.
5. The following equipment is required to administer the instrument: a watch, a pencil, and some blank paper. A piece of paper with CLOSE YOUR EYES is written in large letters and two 5-sided figures intersecting to make a 4-sided figure is also required.
6. If the subject answers 'What did you say?' do not explain or engage in conversation merely repeat the same directions (e.g. 'What year is this?') to a maximum of 3 times.
7. If the subject interrupts, e.g. 'What is this for?' just reply: I will explain in a few minutes when we are finished. Now if we could just proceed please... we are almost finished.

Standardized Mini Mental State Examination (SMMSE)

I am going to ask you some questions and give you some problems to solve. Please try and answer as best as you can.

QUESTIONS	MAXIMUM SCORE
1. (Allow 10 seconds for each reply)	1 point for each answer
a) What year is this? (accept exact answer only)	
b) What season is this? (during last week of the old season or first week of a new season, accept either season)	
c) What month of the year is this? (on the first day of new month, or last day of the previous month, accept either)	
d) What is today's date? (accept previous or next date, e.g. on the 7th accept the 6th or 8th)	
e) What day of the week is this? (accept exact answer only)	
2. (Allow 10 seconds for each reply)	1 point for

- a) What county are we in? (accept exact answer only) each answer
- b) What province/state/country are we in? (accept exact answer only)
- c) What city/town are we in? (accept exact answer only)
- d) **(In clinic)** What is the name of this hospital/building? (accept exact name of hospital or institution only)
- (In home)** What is the street address of this house? (accept street name and house number or equivalent in rural areas)
- e) **(In clinic)** What floor of the building are we on? (accept exact answer only)
- (In home)** What room are we in? (accept exact answer only)

3. I am going to name 3 objects. After I have said all three objects, I want you to repeat them. 3

Remember what they are because I am going to ask you to name them again in a few minutes.

(say them slowly at approximately 1 second intervals)

Ball	Car	Man
------	-----	-----

For repeated use:

Bell	Jar	Fax
Bill	Tar	Can
Bull	War	Pan

Please repeat the 3 items for me.

(score 1 point for each correct reply on the first attempt)

Allow 20 seconds for reply, if subject did not repeat all 3, repeat until they are learned or up to a maximum of 5 times.

4. Spell the word WORLD 5

(you may help subject to spell world correctly)

Say: now spell it backwards please. Allow 30 seconds to spell backwards.

(If the subject cannot spell backwards - even with assistance - score 0)

5. Now what were the 3 objects that I asked you to remember? 3

Ball	Car	Man
------	-----	-----

Score 1 point for each correct response regardless of order, allow 10 seconds.

6. Show wristwatch. Ask: what is this called? 1

Score 1 point for correct response. Accept "wristwatch" or "watch". Do not accept "clock", "time", etc. (allow 10 seconds)

7. Show pencil. Ask: what is this called? 1

Score 1 point for correct response, accept pencil only - score 0 for pen.

8. I'd like you to repeat a phrase after me: "No ifs, ands or buts". 1
 (allow 10 seconds for response. Score 1 point for a correct repetition. Must be **exact**, e.g. No ifs or buts - score 0)

9. Read the words on this page and then do what it says: 1
 Hand the subject a sheet of paper with **CLOSE YOUR EYES** written on it.

CLOSE YOUR EYES

If subject just reads and does not then close their eyes you may repeat: read the words on this page and then do what it says to a maximum of 3 times. Allow 10 seconds, score 1 point **only** if subject closes their eyes. Subject does not have to read aloud.

10. Ask if the subject is right- or left-handed. Alternate right/left hand in statement, e.g. if the subject is right-handed, say: Take this paper in your left hand... Take a piece of paper hold it up in front of subject and say the following: 3

"Take this paper in your right/left hand, fold the paper in half once with both hands and put the paper down on the floor."

Takes paper in correct hand 1

Folds it in half 1

Puts it on the floor 1

Allow 30 seconds. Score 1 point for each instruction correctly executed.

11. Hand subject a pencil and paper. 1

Write any complete sentence on that piece of paper.

Allow 30 seconds. Score 1 point. The sentence should make sense. Ignore spelling errors.

12. Place design, pencil, eraser and paper in front of the subject. 1

Say: copy this design please.

Allow multiple tries until patient is finished and hands it back. Score 1 point for correctly copied diagram. The subject must have drawn a 4-sided figure between two 5-sided figures. Maximum time - 1 minute.

Total Test Score 30

Scoring the figure

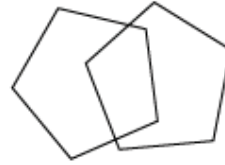
The subject must draw two 5-sided figures intersected by a 4-sided figure.

CORRECT
 Score 1

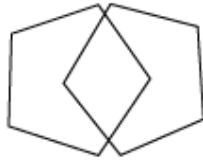
INCORRECT
 Score 0



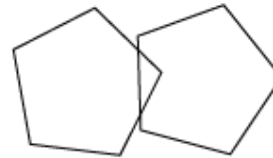
CORRECT
Score 1



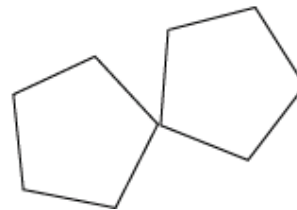
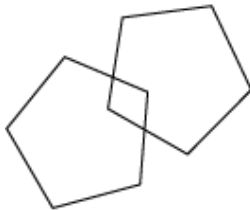
INCORRECT
Score 0



CORRECT
Score 1



INCORRECT
Score 0



Time completed: _____ (minutes)

Scoring "WORLD" backwards

Correct response: DLROW Score 5

Omission of one letter:
e.g. DLRW; DLOW; DROW; DLRO Score 4

Omission of two letters:
e.g. DLR; LRO; DLW Score 3

Reversal of two letters:
e.g. DLORW; DRLOW; DLRWO; DLWOR Score 3

Omission/reversal of three letters:
e.g. DORLW; DL. OW Score 2

Reversal of four letters:
e.g. DRLWO; LDRWO Score 1

Standardized Mini Mental State Examination (SMMSE). Molloy et al, (1991) Geriatric Research Group, McMaster University, Hamilton Civic Hospitals, Hamilton, Ontario, Canada.

KICA-COG: COGNITIVE ASSESSMENT

I'd like to see if you can remember things. I'll ask you some questions.
Incorrect answer enter ...0 Correct answer enter...1

Orientation

- | | | | |
|--|---|---|--------------------------|
| 1. Is this week pension/pay week? | 0 | 1 | <input type="checkbox"/> |
| 2. What time of year is it now?
(may need to prompt eg. wet time...dry time / hot.....cold time?) | 0 | 1 | <input type="checkbox"/> |
| 3. What is the name of this community/place | 0 | 1 | <input type="checkbox"/> |

For questions 4 & 5 you will need three items: comb, pannikin (cup) and matches.

Recognition and naming

- | | | | | | |
|--|-----|----------------|---|---|--------------------------|
| 4. Hold up each item in turn and ask
What do you call this? | 4.1 | comb | 0 | 1 | <input type="checkbox"/> |
| | 4.2 | pannikin (cup) | 0 | 1 | <input type="checkbox"/> |
| | 4.3 | matches | 0 | 1 | <input type="checkbox"/> |

(If the subject has poor vision put each object in their hand and ask them to recognise it.)

- | | | | | | |
|---|-----|----------|---|---|--------------------------|
| 5. Hold up each item in turn and ask
What is this one for? | 5.1 | comb | 0 | 1 | <input type="checkbox"/> |
| | 5.2 | pannikin | 0 | 1 | <input type="checkbox"/> |
| | 5.3 | matches | 0 | 1 | <input type="checkbox"/> |

Hide each object in turn

I'm going to put this one here, this one here... Now don't forget where I put them.
(Omit this if poor vision, and name objects for them to remember.)

Registration

- | | | | | | |
|--------------------------------------|---|---|---|---|--------------------------|
| 6. Tell me those things I showed you | 0 | 1 | 2 | 3 | <input type="checkbox"/> |
|--------------------------------------|---|---|---|---|--------------------------|

Verbal comprehension

- | | | | | |
|---|---|---|--------------------------|--------------------------|
| 7. Shut your eyes | 0 | 1 | <input type="checkbox"/> | |
| 8. First point to the sky and then point to the ground. | 0 | 1 | 2 | <input type="checkbox"/> |

Verbal fluency

9. Tell me the names of all the animals that people hunt.

Time for one minute (Can prompt with: any more? what about in the air? in the water?)

Total No. _____	0 animals:	0	
	1-4 animals:	1	<input type="checkbox"/>
	5-8 animals:	2	
	9 animals or more:	3	

Recall

10. Where did I put the comb? Where did I put the matches? Where did I put the pannikin?

	0	1	2	3		<input type="checkbox"/>
--	----------	----------	----------	----------	--	--------------------------

Visual naming

11. I'll show you some pictures. You tell me what they are. Remember these pictures for later on.

*Point to each picture and ask **What's this?** (Show boomerang as example)*

Now remember them because I'll ask you one more time.

<i>boy, emu, billy/fire, crocodile, bicycle</i>	0	1	2	3	4	5	<input type="checkbox"/>
---	----------	----------	----------	----------	----------	----------	--------------------------

Frontal/executive function

12. Look at this. Now you copy it.

Show alternating crosses and circles

	0	1		<input type="checkbox"/>
--	----------	----------	--	--------------------------

Free Recall

13. You remember those pictures I showed you before? What were those pictures?

Tell me. (Show boomerang as example)

	0	1	2	3	4	5	<input type="checkbox"/>
--	----------	----------	----------	----------	----------	----------	--------------------------

Cued Recall

14. Which one did I show you before? (one of three pictures, use boomerang page as example)

	0	1	2	3	4	5	<input type="checkbox"/>
--	----------	----------	----------	----------	----------	----------	--------------------------

Praxis

15. Open this bottle and pour water into this cup

	0	1	<input type="checkbox"/>
--	----------	----------	--------------------------

16. Show me how to use this comb

	0	1	<input type="checkbox"/>
--	----------	----------	--------------------------

KICA-COG TOTAL SCORE: _____ /39

Score of ≤33/39 indicates possible dementia, refer for medical review.

The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE; short version)

Cognitive assessment card

This test is designed for use by professionals and patients able to speak English fluently.

Instructions

This assessment is directed at the patient's carer, family member or friend and is designed for them to complete. Generally, this test is completed without interference by a doctor or nurse, but it can be talked through with them if they need clarification.

Please give them page 2 and 3, and ask them to follow the instructions for completing the table.

Patient's name: _____

Date of birth: ____ / ____ / ____

Name of person conducting assessment: _____

Job title: _____

Date of assessment: ____ / ____ / ____

The assessment

Now we want you to remember what your friend or relative was like 10 years ago and to compare it with what he/she is like now. 10 years ago was 19___. On the next page are situations where this person has to use his/her memory or intelligence and we want you to indicate whether this has improved, stayed the same or got worse than in that situation over the past 10 years. Note the importance of comparing his/her present performance with 10 years ago. So if 10 years ago this person always forgot where he/she had left things and he/she still does this, then this would be considered 'Not much change'. Please indicate the changes you have observed by circling the appropriate answer.

		1	2	3	4	5
1	Remembering things about family and friends, eg occupations, birthdays, addresses	Much improved	A bit improved	Not much change	A bit worse	Much worse
2	Remembering things that have happened recently	Much improved	A bit improved	Not much change	A bit worse	Much worse
3	Recalling conversations a few days later	Much improved	A bit improved	Not much change	A bit worse	Much worse
4	Remembering her/his address and telephone number	Much improved	A bit improved	Not much change	A bit worse	Much worse
5	Remembering what day and month it is	Much improved	A bit improved	Not much change	A bit worse	Much worse
6	Remembering where things are usually kept	Much improved	A bit improved	Not much change	A bit worse	Much worse
7	Remembering where to find things which have been put in a different place from usual	Much improved	A bit improved	Not much change	A bit worse	Much worse
8	Knowing how to work familiar machines around the house	Much improved	A bit improved	Not much change	A bit worse	Much worse
9	Learning to use a new gadget or machine around the house	Much improved	A bit improved	Not much change	A bit worse	Much worse
10	Learning new things in general	Much improved	A bit improved	Not much change	A bit worse	Much worse
11	Following a story in a book or on TV	Much improved	A bit improved	Not much change	A bit worse	Much worse
12	Making decisions on everyday matters	Much improved	A bit improved	Not much change	A bit worse	Much worse
13	Handling money for shopping	Much improved	A bit improved	Not much change	A bit worse	Much worse
14	Handling financial matters, eg the pension, dealing with the bank	Much improved	A bit improved	Not much change	A bit worse	Much worse
15	Handling other everyday arithmetic problems, eg knowing how much food to buy, knowing how long between visits from family or friends	Much improved	A bit improved	Not much change	A bit worse	Much worse
16	Using his/her intelligence to understand what's going on and to reason things through	Much improved	A bit improved	Not much change	A bit worse	Much worse

Patient's name: _____ Date of birth: ____ / ____ / ____

[Do not leave this section with the patient's carer, family member or friend]

Patient's name: _____

Date of birth: ____ / ____ / ____

Scoring the test

- 1 = Much improved
- 2 = A bit improved
- 3 = Not much change
- 4 = A bit worse
- 5 = Much worse

	Score for this question
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

Total score

To score the test, add up the result of each question (i.e. if 'Much improved' the result is 1 for that question), then divide this number by the total number of questions.

Record the final score of the test in the box below and also add this score to the patient's cognitive assessment record form.

$$\frac{\text{Sum of the results of all of the questions}}{\text{The total number of questions}} = \frac{\quad}{16} = \text{ }$$

Please add the score to the patient's cognitive assessment record form and go to table 3 in 'An introduction to the cognitive tests' for the cut-off point for a positive result. To determine the next steps required, please refer to the cognitive screening algorithm, which can be found in 'An introduction to the cognitive tests' or in the consensus statement.

Jorm AF. A short form of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): development and cross-validation. *Psychol Med* 1994; 24: 145–153.

KICA-Carer: COGNITIVE INFORMANT REPORT

1. Have you noticed that s/he (name) is forgetting a lot of things?

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

2. Does s/he forget the names of his family?

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

3. Does s/he forget what happened yesterday?

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

4. Does s/he forget where s/he is now?

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

5. Does s/he say the same thing over and over?

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

6. Can s/he remember which week is pension week?

	<i>yes</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

7. Does s/he keep walking away and getting lost?

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

8. Does s/he do things that are wrong in Aboriginal way?

(eg. calling out names of people who have passed away)

	<i>no</i>	0	
<i>If yes: Does this happen</i>	<i>sometimes</i>	1	_____
	<i>all the time</i>	2	

KICA-Carer TOTAL SCORE: _____ /16
 Score \geq 3/16 further investigations required

Rowland Universal Dementia Assessment Scale

Rowland **U**niversal **D**ementia **A**ssessment **S**cale

A Multicultural Cognitive Assessment Scale

Administration and Scoring Guide

Funded under the NSW Dementia Action Plan, 1996-2001, a joint initiative of the NSW Health Department and the Department of Ageing, Disability and Home Care.

Introduction

The Rowland Universal Dementia Assessment Scale (RUDAS): A Multicultural Cognitive Assessment Scale – (Storey J, Rowland J, Basic D, Conforti D & Dickson H [2004]*International Psychogeriatrics*, 16(1) 13-31) is a short cognitive screening instrument designed to minimise the effects of cultural learning and language diversity on the assessment of baseline cognitive performance.

When administering the RUDAS it is important that the respondent is encouraged to communicate in the language with which they are most competent and comfortable.

Test administrators should read the following instructions carefully before using the RUDAS.

The Assessment Context – General Guidelines:

Test Anxiety

- Make sure the test taker is as relaxed as possible, as test anxiety can interfere with performance on cognitive tests.

Hearing

- Conduct the RUDAS in a quiet area and make sure the test taker can hear clearly.
- It is important to identify at the beginning of the assessment if the test taker has impaired hearing and accommodate for this as much as possible by speaking slowly and clearly.
- Encourage the test taker to wear any hearing aids. Be careful not to speak too loudly as this may result in distortion. (There is a large print version of the RUDAS for test takers with severe hearing impairment).

Vision

- Ensure that the test taker is using reading glasses where necessary and that there is sufficient light in the room.

Seating

- Sit opposite the test taker. This is important for communication reasons as well as controlling for the difficulty of some items on the RUDAS. Do not sit behind a desk, as this will inhibit the giving of instructions for some items on the RUDAS and may also be intimidating for the test taker.

Recording Responses

- It is important to record the test taker's full response to each item.

Physical Disability

• For test takers who have a physical disability (e.g. vision, hearing, hemiparesis, amputee, stroke, aphasia) which may affect their ability to perform certain items on the RUDAS, it is important to complete the RUDAS as fully as possible but to interpret any total score less than 22 with caution (further research is necessary to assess validity of the RUDAS in this sub-group of patients)

The Language/ Cultural Context: Using a Professional Interpreter

If you are utilising a professional interpreter to administer the RUDAS it is important to consider the following:

1. Interpreters should be used in all situations where the test taker's preferred language is not spoken fluently by the test administrator.
2. Make sure that the language spoken by the interpreter (including the dialect) is the same one with which the test taker is familiar.
3. It is important to explain to the test taker that the interpreter is the facilitator and that you will be asking the questions. This may help to avoid confusion during the assessment.
4. It is better for the interpreter to sit next to the test administrator while the test taker sits opposite. This will reinforce the adjunctive role of the interpreter and make it easier for the test taker to synthesise the non-verbal cues from the test administrator and the verbal cues from the interpreter.
5. It is important to brief the interpreter before starting the assessment:
 - The interpreter should be aware of the general nature of the interaction i.e. that it is a cognitive assessment
 - Remind the interpreter of the importance of concurrent and precise interpreting. Explain that your instructions and the test taker's responses should be interpreted as exactly as possible.
 - Ask the interpreter to take note of any instances during the assessment where the test taker's performance may have been affected by subtle or unintended changes to the meaning of the test instructions due to language or cultural factors
 - Inform the interpreter that it may be necessary at the end of the test for you to clarify a concept covered in the assessment to further make the distinction between the test taker's actual cognitive capacity and potential cultural bias which may arise as a result of the translation process.

Multilingual Test Administrators

If, as the test administrator, you are multilingual it is important to consider all of the same issues which are relevant to the use of a professional interpreter, as well as the following:

- You may need to be careful when translating the RUDAS questions as you might find it more difficult when you have to read in one language and speak in another.
- It is important that you translate the RUDAS questions precisely. Be aware of the differences between formal and informal word usage when translating the RUDAS instructions and recording the test taker's responses.

Item 1 – Memory

Grocery List

1. I want you to imagine that we are going shopping. Here is a list of grocery items. I would like you to remember the following items which we need to get from the shop. When we get to the shop in about 5 minutes time I will ask you what it is that we have to buy. You must remember the list for me.

Tea

Cooking Oil

Eggs

Soap

Please repeat this list for me (Ask person to repeat the list 3 times). (If person did not repeat all four words, repeat the list until the person has learned them and can repeat them, or, up to a maximum of five times.)

Notes:

- Important to give enough learning trials so that test taker registers and retains the list as well as they can (max. of 5 learning trials)
- Ask the test taker to repeat the list back to you at least three times until they can repeat it correctly or as well as they are going to
- Use realistic nature of the scenario and a little humour (if appropriate) to build rapport and make the task less confrontational i.e. WE are going shopping; I am relying on YOU to remember the list FOR ME, so don't forget. When WE get to the shop . . .

- To facilitate learning of the list, use your fingers to list off items on the list when teaching it to the test taker to make the task as concrete as possible e.g. thumb = tea, index finger = cooking oil etc.

Scoring:

This is the learning part of the memory question. There are no points for this part of the question but the memory recall component later in the test has a maximum score of 8 points.

Item 2 - Body Orientation

Body Orientation

2. I am going to ask you to identify/show me different parts of the body. (*Correct = 1, Incorrect = 0*).

Once the person correctly answers 5 parts of this question, do not continue as the maximum score is 5.

- (1) show me your right foot1
 - (2) show me your left hand1
 - (3) with your right hand touch your left shoulder1
 - (4) with your left hand touch your right ear1
 - (5) which is (point to/indicate) my left knee1
 - (6) which is (point to/indicate) my right elbow1
 - (7) with your right hand point to/indicate my left eye1
 - (8) with your left hand point to/indicate my left foot1
-/5

Notes:

- Important to sit opposite the test taker (controls for difficulty of the tasks)
- There doesn't need to be a lot of explanation before starting, just say "I am going to ask you to indicate various parts of the body . . ." - the task is explicit as it evolves

Scoring:

- Although there are 8 parts, this item has a maximum score of 5 points. Once the test taker has 5 correct answers there is no need to continue.
- Be careful with scoring - remember you are sitting opposite the test taker - it is easy to make mistakes so concentrate to make sure you score the person accurately
- There are no half marks, the test taker must get each task 100% correct to be marked correct (e.g. if test taker is asked "with your right hand indicate my left eye" and they use their left hand but still point to your left eye - mark as incorrect)

Item 3 - Praxis

Fist / Palm

3. I am going to show you an action/exercise with my hands. I want you to watch me and copy what I do. Copy me when I do this . . . (i.e. demonstrate - put one hand in a fist, and the other hand palm down on the table or your knees and then alternate simultaneously.) **Now do it with me. I would like you to keep doing this action at this pace until I tell you to stop** - approximately 10 seconds or 5 – 6 sequences. (Demonstrate at moderate walking pace).

Score as:

Normal = 2 (*very few if any errors; self-corrected; progressively better; good maintenance; only very slight lack of synchrony between hands*)

Partially Adequate = 1 (*noticeable errors with some attempt to self correct; some attempt at maintenance; poor synchrony*)

Failed = 0 (*cannot do the task; no maintenance; no attempt whatsoever*)

Notes:

- It is important to sit opposite the test taker (controls for difficulty of the task)
- When teaching the task use the following steps:

Step 1: I want you to put your hands on your knees like this (i.e. put both your hands palm down on your knees (i.e. if no table surface)

Step 2: Now watch carefully as I do this (put one hand in a fist in the vertical position and leave the other hand palm down) - I want you to do this just like I did.

Step 3: Watch me again now as I am doing this (alternate hands simultaneously - one in a fist and the other palm down and keep alternating for 5 - 6 trials).

Step 4: Ask test taker to copy exactly what you are doing. If test taker is confused and has not learned the task successfully then repeat Steps 1, 2 and 3

Step 5: Once test taker has learned the task (i.e. understands as well as possible what they are meant to do - regardless of whether or not they can do it 100%), ask them to repeat the exercise at the pace you demonstrate until you tell them to stop (now demonstrate task -intervals between change of hands should reflect moderate walking pace). Do not allow the test taker to copy you when scoring – must demonstrate the task independently

Scoring:

This question has a maximum score of 2 points.

..../2

In order to help distinguish between the three levels of competence, refer to the following table:

Score	Fist/Palm Integrity	No. of Errors	Fluency	Ability to Self-Correct	Progressive Improvement	Synchrony
Normal	Good adherence to 'palm down' and 'fist' actions with few intrusions or incorrect variations	Minimal	Good	Good	Clearly evident	Only very slight lack of synchrony
Partially Adequate	Obvious intrusions and incorrect variations in 'palm down' and 'fist' actions	Noticeable	Some attempt to maintain	Some attempt	Some indication	May be noticeable lack of synchrony
Failed	Barely able to identify correct 'palm down' and 'fist' actions because of many intrusions and incorrect variations	Many	Poor or none	None	Very little or none	Little or no synchrony

Normal

A person who performs normally on this task should exhibit signs of intact learning and should be able to replicate clearly, the 'fist in the vertical position' and 'palm down' actions.

Their performance on the task should improve with progressive learning trials to a point where they can do the task fluently with minimal errors. The test taker should demonstrate the ability to self- correct, show

progressive improvement over the course of the task and have only very slight lack of synchrony between the hands.

Partially Adequate

A person whose response is partially adequate will make noticeable errors e.g. occasionally places palm up instead of palm down or may place palm up instead of converting to the fist or may form the fist in the horizontal position. They may have to stop occasionally in order to self-correct but even if they are unable to perform the task perfectly there should be some evidence that they have learned the task, some attempt to self-correct and some indication of an attempt to maintain the fluency of the alternating hands. There may be a noticeable lack of synchrony between the hands.

Failed

A person who fails this task shows very little if no ability to understand and execute the task. There are many errors, very little or no evidence of improvement, inability to self-correct, poor maintenance, and obvious inability to emulate correct hand positions and to perform the simultaneous changing of hands with any synchrony. A person who fails may not be able to form a fist or distinguish between palm up and palm down, may not alternate the actions across hands and may not be able to use both hands together at all.

Item 4 - Drawing

Visuo-Constructional Cube Drawing

4. Please draw this picture exactly as it looks to you (Show cube on back of page).

(Yes = 1; No = 0)

Score as:

(1) Has person drawn a picture based on a square?

.....1

(2) Do all internal lines appear in person's drawing?

.....1

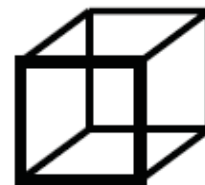


(3) Do all external lines appear in person's drawing?

.....1



..../3



Notes:

This question has a maximum of 3 points.

- Show test taker cue card of cube drawing
- If there is no cue card, the test administrator can draw the cube onto plain (not lined) paper.
- Make sure that test taker can see the drawing clearly (check that they are wearing prescription glasses if applicable)
- Ask test taker to draw the picture of the cube as well as they can

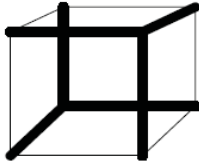
Scoring:

Has test taker drawn a picture based on a square? (i.e. There is a square somewhere in the drawing)

YES / NO

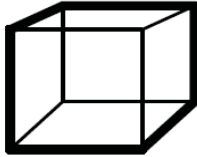
Do all internal lines (i.e. dark lines) appear in test taker's drawing?

YES / NO



Do all external lines (i.e. dark lines) appear in test taker's drawing?

YES / NO



..../3

Item 5 - Judgement

Judgement - Crossing the Street

5. You are standing on the side of a busy street. There is no pedestrian crossing and no traffic lights. Tell me what you would do to get across to the other side of the street **safely**. (If person gives incomplete answer use prompt: "Is there anything else you would do?") Record exactly what the patient says and circle all parts of response which were prompted.

.....

Score as:

Did person indicate that they would look for traffic?

(YES = 2; YES PROMPTED = 1; NO = 0)

..../2

Did person make any additional safety proposals?

(YES = 2; YES PROMPTED = 1; NO = 0)

..../2

..../4

Notes:

- If the test taker gives no response to the question or says "I don't know", then repeat the question once only.
- Except where the test taker answers both parts of the question on the first attempt, use the prompt 'Is there anything else you would do' in all situations. This is to gain as complete a response as possible from the test taker.
- Use only the general prompt 'Is there anything else you would do' – do not prompt the person in any other way
- Record test taker's response to this question.
- Circle any part of test taker's response which was prompted and score accordingly.
- If the test taker says that they never cross the road by themselves (e.g. they are in a wheelchair or their eyesight is poor), then ask them the question again but modify as follows:
 "What would anyone who wanted to cross the road have to do to get across safely?"

Scoring:

This item has a maximum score of 4 points. Each of the two parts:

1. look for traffic, and
2. additional safety proposal

has a total score of 2 points i.e. Yes = 2; Yes Prompted = 1; No = Zero
 i.e.

- Did test taker indicate that they would look for traffic?

YES / YES PROMPTED / NO

2 1 0

Examples of Correct Responses	Examples of Incorrect Responses
I would look for traffic	Just go across
Look left and right	Put my hand up so traffic knows I want to cross
Check the cars	Go to the corner and cross
Go across when there is nothing coming	I wouldn't go across

• Did test taker make any additional safety proposals in road crossing scenario?

YES / YES PROMPTED / NO

2 1 0

Examples of Correct Responses	Examples of Incorrect Responses
Cross to the middle of the road and then look again to make sure there was no traffic before going right across	Run as fast as I can
Keep looking for traffic while crossing	Cross when the walk sign is green
Go across quickly but without running	Cross at the crossing
Be careful	Just put my head down and go
Wait till I could cross with some other people	
Ask for help	

Scoring Examples:

Example 1

"I don't know. (Repeat the question).

"I'd look for the cars. I can't think of anything else except be careful."

This response would score 3 points out of a total of 4 because the person said that they would look for the cars (2/2) and when prompted (i.e. circle indicates that it was prompted) said that they would be careful (1/2) i.e. 2/2 + 1/2 = 3/4

Example 2

"Just go across. Check for the cars."

This response would score 1 point only out of a total of 4 because the first part of the answer 'just go across' was incorrect (0/2), and the second part of the answer 'check for the cars' while correct, was prompted (i.e. because it was circled to indicate that it was prompted) (1/2) i.e. 0/2 + 1/2 = 1/4

Example 3

"Put my hand up so the traffic knows I want to cross and then walk to the middle of the road before going right across."

This response would score 2 points out of a total of 4 because the first part of the answer is incorrect (0/2) and the second part of the answer 'then walk to the middle of the road before going right across' is correct (2/2) i.e. 0/2 + 2/2 = 2/4

Item 1 – Memory

Memory Recall (Item 1 Revisited - 4 Grocery Items)

1. We have just arrived at the shop. (Can you remember the list of groceries we need to buy? (Prompt: If person cannot recall any of the list, say "The first one was 'tea'.")

(Score 2 points each for any item recalled which was not prompted.)

Circle 'Tea' if used as a prompt and score as 0 out of 2)

Tea2
Cooking Oil2
Eggs2
Soap2
..../8

Notes:

- Ask test taker to repeat the 4 items on the grocery list
- If after 20 - 30 seconds the test taker cannot remember learning the list OR any of the items on the list then use the prompt - i.e. the first one was 'tea' and then circle 'tea' or write a 'P' in parentheses after it to indicate that it was prompted and score as zero
- Use the prompt 'the first one was 'tea'', only if the person cannot remember any of the grocery items
- Do not use any other prompts in this task (e.g. if the person says 'cooking oil' but cannot remember any of the other grocery items on the list do not use the 'tea' prompt or any other prompt)

Scoring:

The recall component of the memory item has a maximum score of 8 points.

- There are no part marks, the person scores either zero or 2 points for each item on the grocery list
- If 'tea' was used as a prompt then the maximum score the person can get on this task is 6/8
- mark as correct if the person says 'cooking oil' or 'oil'

Item 6 - Language**Language Generativity – Animal Naming**

6. I am going to time you for one minute. In that one minute, I would like you to tell me the names of as many different animals as you can. We'll see how many different animals you can name in one minute. (Repeat instructions if necessary). Maximum score for this item is 8. If person names 8 new animals in less than one minute there is no need to continue.

- 1. 5.
 - 2. 6.
 - 3. 7.
 - 4. 8.
-/8

Notes:

This item has a maximum score of 8 points.

- Time the test taker for one minute ONLY - make sure that it is clear to the test taker when to start i.e. “When I say ‘Go’ you should start listing animals. Don’t worry about me writing them down, say the animals as quickly as you can.”
- If test taker does not speak English make sure that interpreter also understands the instructions and the importance of simultaneous interpreting.

Scoring:

- If test taker says for example – ‘big horse’ and ‘little horse’, then record these as two separate animal names. Then at the end of the assessment, if the person is from an NESB country, check with the interpreter that these two names actually represent different concepts in the relevant language (e.g. in English – ‘big horse’ and ‘little horse’ are not separate animal names therefore an ESB person would score only one point (BUT, if the ESB person had said ‘horse’ and ‘foal’ then these are two separate concepts and the person would score two points). An NESB person depending on the language spoken may score two points if they used the correct two words for ‘big horse’ and ‘little horse’. It is important here to distinguish between perseveration (i.e. repetition of the same animal name) and linguistic peculiarities of different languages which conceptualise/describe animals differently.

TOTAL SCORE

Add up the scores for each item to get a **total score out of 30**.

Any score of 22 or less should be considered as possible cognitive impairment and referred on for further investigation by the relevant physician.

Attachment 4: Instrument Reviews Concerning Physical Function

Barthel Index

Title:	Barthel Index (10 item version)
Abbreviations:	None
Author(s) Name:	<p>F. Mahoney and Dorothea Barthel (1965) created the Barthel Index over 40 years ago. It was formerly known as the Maryland Disability Index and was first published in 1958.</p> <p><i>** This review focuses on the recommended modification of the Barthel Index using Collin et al. (1988) scoring which is accepted in Australia (Eagar et al., 2001, Eagar et al., 2006). **</i></p>
Author(s) Address:	As Mahoney and Barthel created the index nearly 40 years ago, it is unlikely that either author is still available.
Supplied by:	Available in McDowell (2006)
Cost:	No permission is required to use this instrument (Bowling, 2005)
Training requirements:	None
Purpose:	<p>To assess activities of daily living (ADL) functions of adults. It was designed to monitor performance in chronic patients before and after treatment and to indicate the level of nursing care required (McDowell, 2006).</p> <p>The Barthel Index is a “classic instrument in ADL assessment” (Pearson, 2004, page 31) and “represents probably the oldest and most widely used scale to assess physical disability in elderly patients in general.” (page 190, Burns et al., 2004). The scale is also extremely popular among neurologists” (page 196, Bowling, 2001).</p>
Administration time:	A trained observer may take 2 - 5 minutes
Instrument Type:	Clinical rating scale (can also be self-administered). The scale can be completed from patient report, proxy report, medical records and direct observation. (Administration time is longer if based on direct observation.)
Structure:	The Index contains 10 ADL items looking at personal care or self-care and mobility (feeding, mobility from bed to wheelchair, personal toilet - washing, getting on and off toilet, bathing, walking on a level surface -propel wheelchair, going up and down stairs, dressing, bowel and bladder incontinence).
Scoring:	<p>A modification of the 10 item version using a 20 item scoring system (20 point) was produced by Collin et al. (1988). Scores range from 0 to 2 or 3 for each activity and a score less than 4 indicates total dependence and a score less than 12 indicates dependence (Gupta, 2008). (This replaces the original, Mahoney and Barthel, 0 – 100 scoring.)</p> <p>“For care planning purposes or treatment purposes, the individual task scores are more useful in identifying patient needs than is the total score.” (Pearson, 2004, page 32)</p>

In terms of clinical cut-points, Sulter et al. (1999) found a variety of scores to define favourable outcomes in clinical trials used for Stroke patients. They would recommend defining a poor outcome (as opposed to a favourable outcome) and use a Barthel Index score of less than 60 points (100-point original version).

Developed for:

Inpatient adults and has been extended to adults living in the community (*Granger's modification of the Barthel Index has been shown to correlate with the need for home health services / support with ADLs (see Gallo, 2006, page 201-202).*

Normative Data:

No information was found.

Clinical/Reference Data:

Extensive clinical data is available including from Australia. It forms part of the HACC minimum dataset (Eagar et al., 2001).

A number of clinical studies were found, including use with the following disease or injury groups:

Disease / Injury Groups:

- Amputees: O'Toole, Goldberg and Ryan (1985)
- Depression in older adults: Onishi et al. (2006)
- Frail Elderly: Amici et al. (2008)
- Geriatrics: Stone, Herbert, Chrisostomou, Vessey and Horwood (1993)
- Hip Fracture: Cameron, Lyle and Quine (1993); Balen et al. (2003)
- Spinal Cord Injury: Roth, Lawler and Yarkony (1990)
- Stroke: Wood-Dauphinee, Williams and Shapiro (1990); Carod-Artal et al. (2002); Ada et al. (2006) (Systematic Review)
- Traumatic Brain Injury: Tuel, Presty, Meythaler, Heinemann and Katz (1992)

The Barthel Index is widely used, especially in the area of stroke. It has been used as an outcome measure in several systematic reviews and meta-analyses:

- Sanchi (herbal medicine) in stroke patients: Chen et al. (2008) (Systematic Review)
- Oral citicoline in acute stroke: Davalos et al. (2002) (Meta-analysis)
- Acupuncture in stroke: Park et al. (2001) (Systematic Review)
- Impact of Fever in stroke and brain injury: Greer et al. (2008) (Systematic Review)
- Impact of exercise therapy on stroke patients: Galvin et al. (2008) (Meta-analysis)
- Stroke Rehabilitation (Kalra and Crome, 1993)
- Strength training with stroke patients: Ada et al. (2006) (Systematic Review)

Applications:	<p>The index is used in rehabilitation outcome measurement and as a therapy planning tool.</p> <p>Apart from the Collin et al. (1988) scoring version of the Barthel Index, there are another two major versions cited in the literature. These are by Granger et al. (1979) and Shah et al. (1989).</p> <p>Granger, et al. (1979) (as cited in McDowell, 2006) produced an expanded 15 item versions of the scale. The four-point response scale is recommended (Fortensky et al., 1981, as cited in McDowell, 2006). Granger and colleagues regard their changes to the scale as obsolete and have been replaced by the Functional Independence Measure (FIM) (Bowling, 2005).</p> <p>Shah et al. (1989) (as cited in McDowell, 2006) used the original items but rated each item on a five point scale to improve sensitivity to change. The scale categories were: unable to perform task / attempts task but unsafe / moderate help required / minimal help required / fully independent (Bowling, 2001).</p> <p>McDowell (2006) reports that there are also 12, 14, 16 and 17 item versions of the index and that caution is required in comparing studies. One version also includes some items on cognitive function.</p> <p>Self-report versions have been created by McGinnis et al. (1986) (cited in McDowell, 2006) and Gompertz et al. (1993a, 1993b) (cited in Bowling, 2001). Shinar et al. 1987 (cited in Pearson, 2004) have created a telephone version of the index.</p> <p style="text-align: center;">***</p> <p>The Barthel Index is often compared to a more advanced measure, the FIM instrument.</p> <p>In a comparative review, Hobart et al. (2001) finds that the Barthel Index and the FIM and Functional Assessment Measure (FAM) motor items are similar measures of physical disability. Cano et al. (2006) found equivalent effect sizes between the Barthel Index and the FIM, even though the FIM has more response options.</p> <p>Nyein et al. 1999 derived a Barthel Index score from the FIM instrument which correlates very well with the actual score (Spearman's rho = 0.89). Eagar et al. (1997) found high correlations between the FIM and Barthel Index for several Rehabilitation units in Australia (n=511) and have produced mapping values for a Barthel Index score to a FIM motor score.</p> <p>In the stroke literature, the Barthel Index is often compared with the Rankin Scale (see Banks et al., 2007).</p> <p>The Barthel Index has a strong relationship with the Australian Resident Classification Scale (Stepien et al., 2006).</p> <p>Hsueh et al. (2002) has produced a 5 item Barthel Index for stroke patients, while the scale has comparable properties to the FIM (Motor) and the 10 item Barthel Index it had limited ability to discriminate between severe patients on admission to rehabilitation.</p>
Carer and/or Patient Use of Instrument:	<p>The Gompertz version, mentioned above, can be used with a lay interviewer.</p>

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	<p>Cohen & Marino (2000)</p> <p>Sherwood, Morris, Mor & Gutkin (1977)</p> <p>Bowling (2005)</p> <p>Pearson (2004)</p>	<p>X Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>Cronbach's alpha results:</p> <p>Alpha = 0.95 - 0.96 (cited in Pearson, 2004)</p> <p>Alpha = 0.96 De Haan et al., 1993 (cited in Bowling, 2005)</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	<p>Wade (1992)</p> <p>Collin, Wade, Davies & Horne (1988)</p> <p>Granger, Albrecht & Hamilton (1979)</p>	<p>X ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>A recent study by Green et al. (2001) found good test-retest reliability for the Barthel Index in a group of stroke patients less than one year post stroke, tested 1 week apart (n=22).</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	<p>Wade (1992)</p> <p>Granger, Albrecht & Hamilton (1979)</p> <p>Pearson (2004)</p> <p>McDowell (2006)</p> <p>Bowling (2001, 2005)</p> <p>Sainsbury et al. (2005)</p> <p>Sackley et al. (2005)</p>	<p>X Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p><input type="checkbox"/> No information provided</p> <p><input type="checkbox"/> Not applicable</p>	<p>Inter-rater reliability results:</p> <p>0.88 - 0.99 (Pearson, 2004)</p> <p>Kappa range = 0.82 - 0.90 (De Haan et al., 1993 cited in Bowling, 2005)</p> <p>0.99 (Roy et al., 1988, as cited in McDowell, 2006)</p> <p>Collin et al. (1987) (as cited in McDowell, 2006) found high agreement (60%) across all ratings when comparing the following four modes: self-report, nurse clinical impression, nurse testing, and physiotherapist testing.</p> <p>Self-reports naturally have lower correlations with Barthel ratings. Reliability data on the self-reported versions is provided in McDowell (2006).</p>

			<p>Ranhoff and Laake (1993) (as cited by Bowling, 2001) report some disparity in nurse observations and doctor interviews for patients with cognitive impairment.</p> <p>Sainsbury et al. (2005) report fair to moderate reliability and high agreement for items and total score when the Barthel Index was used in studies with older people. However, there may be some inter-observer disagreement with regard to disability categories / severity levels. There is also less reliability with the Scale when patients are cognitively impaired and when scores are obtained by interview rather than testing. They also note that the role of assessor training and administration guidelines on the reliability of the Barthel Index has not been investigated.</p> <p>Sackley et al. (2005) reports high inter-rater reliability and moderate test-retest reliability when the Barthel scale was compared with the Berg Balance Scale and the Rivermead Mobility Index for a group of physiotherapy patients with a learning disability (n=47).</p>
--	--	--	--

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>	<p>Wade (1992) (cited by Bowling, 2001)</p> <p>Wade and Collin (1988) (cited by Bowling, 2001)</p>	<p><input type="checkbox"/> Patients/target groups and experts were involved during item selection and/or item reduction</p> <p><input type="checkbox"/> Patients/target groups were consulted for reading and comprehension</p> <p><input checked="" type="checkbox"/> No patient/target group involvement</p> <p><input type="checkbox"/> No information found on content validity</p> <p><input type="checkbox"/> There is an adequate coverage of relevant domains</p> <p><input checked="" type="checkbox"/> There is limited coverage of relevant domains</p>	<p>Not applicable as this instrument was developed by summarising years of clinical practice.</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>McDowell (2006)</p> <p>Bowling (2005)</p> <p>Sansoni et al. (2008)</p>	<p><input checked="" type="checkbox"/> Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <p><input type="checkbox"/> Limited construct validity information reported</p> <p><input type="checkbox"/> Inadequate or no information on construct validity reported</p>	<p>For physically disabled patients correlates when with other functional measures 0.65 - 0.69 (Mattison, et al., 1991, as cited by Bowling, 2005).</p> <p>For stroke patients (Wilkinson et al., 1997 cited in Bowling 2005) correlates with the SF-36 (0.81), Nottingham (-0.84), London Handicap Scale (.73).</p> <p>Spear et al. (2002) and Ballard et al. (2001) find that the Barthel Index correlates with quality of life measures for dementia patients (i.e. the DEMQOL and Dementia Care Mapping QoL indices respectively) (as cited by Sansoni et al. 2008).</p> <p>For community dwelling, dementia patients Silver, et al. (2001) reported a high correlation (-0.73) between the Barthel Index and the Clinical Dementia Rating (CDR) (as cited by Sansoni, et al. 2008).</p>
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	<p>Gresham & Labi (1984)</p> <p>Wade (1992);</p>	<p><input type="checkbox"/> No evidence provided/failed a test of dimensionality</p> <p><input checked="" type="checkbox"/> Some evidence</p>	<p>Wade and Hewer 1987 (cited in McDowell, 2006) showed that the Barthel Index correlated with an</p>

	<p>Basmajian (1994)</p> <p>Dittmar & Gresham (1997)</p> <p>Cohen and Marino (2000)</p> <p>McDowell (2006)</p> <p>Bowling (2005)</p>	<p>provided to support internal structure</p> <p><input type="checkbox"/> Substantial evidence provided to support internal structure</p>	<p>index of motor ability in stroke patients and had a two factor structure (mobility and self-care). Some evidence for the hierarchy of recovery in function was also reported.</p> <p>De Haan et al. (1993) (cited in Bowling, 2005) reports of a single factor accounting for 81 % of the variance in stroke patients.</p>
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Gresham, Phillips & Labi (1980)</p> <p>Gresham & Labi (1984)</p> <p>Basmajian (1994)</p> <p>Dittmar & Gresham (1997)</p> <p>Cohen and Marino (2000)</p> <p>Pearson (2004)</p> <p>Sansoni et al. (2008)</p> <p>Baro et al. (2006)</p> <p>Cobo et al.</p> <p>Plantinga et al. (2006)</p>	<p>X Correlations with other measures are reported</p> <p><input type="checkbox"/> Correlations not reported</p>	<p>Low scores correlated with increased mortality (Beaton and Voge 1998 cited in Pearson, 2004)</p> <p>Sansoni et al. (2008) report on the usefulness of the Barthel Index in assessing residential care needs for the elderly (citing papers by Challis et al., 2000, and Quartararo et al., 1991) and for predicting discharge destination on a geriatric rehabilitation ward (citing a paper by Stone et al. 2004).</p> <p>Wolstenholme et al. (2002) (cited by Sansoni et al., 2008) examined Barthel scores with the costs of health care for dementia patients.</p> <p>Baro et al. (2006) found a correlation of between 0.39 and 0.40 for scores on the Barthel Index and the Physical Mobility scale of the Nottingham Health Profile for a groups of hospitalised older adults with varying degrees of cognitive impairment (n=134).</p> <p>Cobo et al. reports that in a group of stroke patients post-treatment (n=1652) that the Barthel Index, the NIH Stroke Scale and the modified Rankin Scale shared 90% of their information. They also caution against collapsing ordinal full scale data into fewer categories.</p> <p>Plantinga et al., (2006) reports correlations between the Northwick Park Dependency Score</p>

			and the Barthel Index ($r=-0.70$ to -0.93) for different patient groups including stroke, SCI, head injury, multi-trauma, rheumatoid arthritis, diabetes, lung and heart disease.
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Wade (1992)</p> <p>Cohen and Marino (2000)</p> <p>Sulter et al. (1999)</p> <p>Huybrechts et al. (2007)</p>	<p>X Scale differentiates between relevant categories of respondents</p> <p><input type="checkbox"/> No information provided on discriminant validity</p>	<p>Huybrechts et al. (2007) in their review of the literature find a lack of uniformity in the way the Barthel Index is used as an outcome measure. This issue has also been identified by Sulter et al. (1999). Further work in this area is required.</p> <p>Low correlations reported between the Barthel Index and a scale measuring memory and behaviour problems in head injured patients (Jackson et al., 2007).</p>
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>	<p>Collin & Wade (1988)</p> <p>Wade (1992)</p> <p>Cohen and Marino (2000)</p> <p>McDowell (2006)</p> <p>Bowling (2005)</p> <p>Bowling (2001)</p> <p>Huybrechts et al. (2007)</p>	<p>X Comparison made to criterion measures</p> <p><input type="checkbox"/> Limited comparison with criterion measures provided</p> <p><input type="checkbox"/> No comparison with criterion measures provided</p>	<p>Good predictive evidence has been reported on the Index for LOS, prognosis and discharge outcomes.</p> <p>Barthel scores are predictive of death and LOS recovery in stroke patients (described by Wylie and White 1964, and Wylie 1967 as cited in McDowell (2006) and Kalra and Crome (1993).</p> <p>Huybrechts et al. (2007) in their more recent review found limited information to support the use of the Barthel Index in order to predict mortality.</p>
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p>	<p>Bowling (2001)</p> <p>Bowling (2005)</p> <p>Huybrechts et al. (2007)</p> <p>van Exel et al. (2004)</p>	<p><input type="checkbox"/> Authors provide 2 or more types of information on interpretability</p> <p>X Authors provide limited information to assist with interpretability</p> <p><input type="checkbox"/> No information provided</p>	<p>Bowling (2001, 2005) comments that and that item changes may not reflect actual changes in disability.</p> <p>Huybrechts et al. (2007) find that the Barthel Index is a strong predictor of care needs and recovery after stroke. Though there is a lack of uniformity in the way the Barthel Index is used as an outcome measure (see Discriminant Validity section above).</p> <p>van Exel et al., (2004) suggests that the Barthel</p>

Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced		Index can be used as a proxy for the EuroQol-5D in cost-effectiveness studies post stroke.
--	--	--

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>	Bowling (2005)	<input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects were detected <input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score <input checked="" type="checkbox"/> No or limited information provided on floor and ceiling effects	<p>Not sensitive to changes beyond the end-points of the scale (McDowell and Newell 1996, as cited by Bowling, 2005).</p> <p>The Index is less powerful than the earlier developed Rankin Scale in stroke patients (Young et al., 2003, cited in Bowling, 2005).</p>
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>	Granger et al. (1979) Cohen & Marino (2000) Pearson (2004) Bowling (2001) Bowling (2005) Houlden et al. (2006) Denkinger et al. (2009) Gupta (2008) Kalra and Crome (1993)	<input checked="" type="checkbox"/> Hypotheses were formulated and results were in agreement <input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard) <input type="checkbox"/> No information on sensitivity to change was provided <input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful <input type="checkbox"/> MCID – No information was provided.	<p>Mixed results are reported in the literature.</p> <p>Pearson (2004) reports that the Index is not very sensitive to change in performance.</p> <p>Wade and Hewer 1987 (cited by Bowling, 2005) demonstrated that the scale was sensitive to recovery in stroke patients.</p> <p>Gupta (2008) and Kalra and Crome (1993) note the scale correlates well with physician assessment of progress.</p> <p>The scale was less sensitive to clinical change for elderly patients attending a day clinic (Rodgers et al., 1993 and Parker et al., 1994, as cited in Bowling 2001, 2005).</p> <p>The scale also may also be dependent on the patient's location e.g. bathing assistance, use of walking aids in a nursing home (McMurdo and Rennie, 1993, as cited in Bowling, 2005).</p> <p>A recent paper by</p>

			<p>Denkinger et al. (2009) reports that the Barthel Index is sensitive to change in measuring functional status of geriatric patients undergoing inpatient rehabilitation.</p> <p>Houlden et al. (2006) reports that the Barthel Index and the FIM total and motor scores have similar levels of responsiveness in a group of mixed neurological patients (TBI and Stroke) undergoing rehabilitation.</p>
--	--	--	---

Cultural Applicability and Cultural Adaptations:

The index has been used in many languages and cultures, including French, German, Dutch, Japanese and Chinese (Dittmar and Gresham, 1997). McDowell (2006) reported that the Barthel Index has been tested in Japan and Pakistan. Cabanero-Martinez et al. (2009) looking at the Spanish Literature reports that there are a number of versions of the Barthel Index used in Spain, notes they have weak processes of language and cultural adaption and limited standards for administration.

Gender Appropriateness:

Appropriate for use with both genders.

Age Appropriateness:

Adults

Summary:

The Barthel index is simple to use and a popular measure of ADL functioning (self-care and mobility), especially for elderly people with neurological conditions. However, the index is less useful in community settings as it needs to be supplemented by items examining using instrumental activities of daily living (IADLs) (e.g. cooking and cleaning) (Bowling, 2001). Other criticisms of the scale include: that changes in function can occur beyond the scale's end-points (Bowling, 2001, 2005); that it is narrow in range and misses low levels of disability (McDowell, 2006); and that it measures what a patient actually does (does do vs. can do), rather than their ability (Bowling, 2001).

The review indicates the Modified Barthel Index (Further information is required requiring its inter-rater and test-retest reliability and application in Australia, especially in relation to the effects of training and user guides. Clinical reference norms are also required for age, sex and medical condition (McDowell, 2006). This would assist with outcomes interpretation and determine any floor and ceiling effects.

Both the standard psychometric texts McDowell (2006) and Bowling (2001, 2005) highlight major criticisms regarding the scoring and standardisation of the Barthel Index. McDowell (2006) advises that with the many versions available and the different scoring approaches that caution is required with interpretation of scores and that greater coordination is needed in the further development of the index. While Bowling (2001, 2005) focuses on the need for scoring consistency and standardisation; and that item changes may not reflect actual changes in disability.

Finally, while the Barthel Index is a standard instrument in the field it has been taken over by newer instruments (Pearson, 2004).

Reporter: Nicholas Marosszeky

Date of report: April 2010

References

Ada L, Dorsch S, Canning CG, et al (2006) *Strengthening interventions increase strength and improve activity after stroke: a systematic review*. Australian Journal of Physiotherapy. Vol. 52, pp.241-248.

Amici A, Baratta A, Linguanti A, et al (2008) *The Marigliano-Cacciafesta Polypathological Scale: A tool for assessing fragility*. Archives of Gerontology and Geriatrics. Vol. 46, pp.327-334.

Balen RV, Essink-Bot ML, Steyerberg EW, et al (2003) *Quality of life after hip fracture: A comparison of four health status measures in 208 patients*. Disability and Rehabilitation: An International, Multidisciplinary Journal. Vol. 25, pp.507-519.

Banks JL, Marotta CA, Banks JL, et al (2007) *Outcomes validity and reliability of the modified Rankin scale: implications for stroke clinical trials: a literature review and synthesis*. Stroke. Vol. 38, pp.1091-1096.

Baro E, Ferrer M, Vazquez O, et al (2006) *Using the Nottingham Health Profile (NHP) among older adult inpatients with Varying Cognitive Function*. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation. Vol. 15, pp.575-585.

Basmajian, J. (Ed.) (1994). *Physical Rehabilitation Outcome Measures*. Toronto, Ontario, Canada: Canadian Physiotherapy Association in Co-operation with Health and Welfare Canada and the Canadian Communications Group – Publishing, Supply & Services Canada.

Bowling, A. (2001) *Measuring Health: A Review of Quality of Life Measurement Scales*. 2nd Ed. Buckingham, Open University Press.

Bowling, A. (2005) *Measuring health: a review of quality of life measurement scales (3rd ed.)*. Open University Press, Berkshire, England

Cabanero-Martinez MJ, Cabrero-Garcia J, Richart-Martinez M, et al (2009) *The Spanish versions of the Barthel index (BI) and the Katz index (KI) of activities of daily living (ADL): a structured review*. Archives of Gerontology & Geriatrics. Vol. 49, pp.77-84.

Cameron, I.D., Lyle, D.M. & Quine, S. (1993). *Accelerated rehabilitation after proximal femoral fracture: A randomised controlled trial*. Disability and Rehabilitation. Vol.15, pp.29-34.

Cano S, O'Connor R, Thompson A, et al (2006) *Exploring disability rating scale responsiveness II: Do more response options help*. Neurology. Vol. 67, pp.2056-2059.

Carod-Artal FJ, Gonzalez-Gutierrez JL, Herrero JAE, et al (2002) *Functional recovery and instrumental activities of daily living: Follow-up 1-year after treatment in a stroke unit*. Brain Injury. Vol. 16, pp.207-216.

Chen X, Zhou M, Li Q, et al (2008) *Sanchi for acute ischaemic stroke*. Cochrane Database of Systematic Reviews. No. 4, pp.CD006305.

Cobo E, Secades JJ, Miras F, et al (2010) *Boosting the chances to improve stroke treatment*. Stroke. Vol. 41, pp.e143-50.

Cohen, M., & Marino, M. (2000) *The tools of disability outcomes: research functional status measures*. Archives of Physical Medicine and Rehabilitation. Vol. 81, pp.S21-S29.

Collin, C., Wade, D. T., Davies, S., & Horne, V. (1988) *The Barthel ADL index: a reliability study*. International Disability Studies. Vol.10, pp.61-63.

Davalos A, Castillo J, Alvarez-Sabin J, et al (2002) *Oral citicoline in acute ischemic stroke: an individual patient data pooling analysis of clinical trials*. Stroke. Vol. 33, pp.2850-2857.

Denkinger MD, Igl W, Coll-Planas L, et al (2009) *Evaluation of the short form of the Late-Life Function and Disability Instrument in geriatric inpatients: Validity, responsiveness, and sensitivity to change.* Journal of the American Geriatrics Society. Vol. 57, pp.309-314.

Dittmar, S. S. & Gresham, G. E. (1997) *Functional Assessment and Outcome Measures for the Rehabilitation Health Professional*. Gaithersburg, Maryland, Aspen Publishers Inc.

Eagar, K et al. (2001) *Stage 1: Report of the HACC dependency data items project*. Wollongong, CHSD, University of Wollongong.

Eager, K et al. (1997) *The Australian National Sub-Acute and Non-Acute Patient Classification (AN-SNAP): report on the National Sub-Acute and Non-Acute Casemix Classification Study*. Wollongong, CHSD, University of Wollongong

Eager K, Owen A and Marosszeky N (2006) *Towards a Measure of Function for Home and Community.* Australian Journal of Primary Health. Vol. 12, pp.73-81.

Gallo JJ, Bogner HR, Fulmer T, et al (2006) *Handbook of geriatric assessment (4th ed.)* Jones and Bartlett Publications Boston.

Galvin R, Murphy B, Cusack T, et al (2008) *The impact of increased duration of exercise therapy on functional recovery following stroke--what is the evidence?* Topics in Stroke Rehabilitation. Vol. 15, pp.365-377.

Granger, C. V., Albrecht, G. L., & Hamilton, B. B. (1979) *Outcome of comprehensive medical rehabilitation: measurement by PULSES profile and the Barthel Index.* Archives of Physical Medicine and Rehabilitation. Vol. 60, pp.145-154.

Green J, Forster A and Young J (2001) *A test-retest reliability study of the Barthel Index, the Rivermead Mobility Index, the Nottingham extended Activities of Daily Living Scale and the Frenchay Activities Index in stroke patients.* Disability and Rehabilitation: An International, Multidisciplinary Journal. Vol. 23, pp.670-676.

Greer DM, Funk SE, Reaven NL, et al (2008) *Impact of fever on outcome in patients with stroke and neurologic injury: a comprehensive meta-analysis.* Stroke. Vol. 39, pp.3029-3035.

Gresham, G. E. & Labi, M. L. C. (1984) Functional assessment instruments currently available for documenting outcomes in rehabilitation medicine, in C.V. Granger & G.E. Gresham (Eds). *Functional Assessment in Rehabilitation Medicine*. Baltimore: Williams & Wilkins.

Gresham, G. E., Phillips, T. F. & Labi, M. L. (1980). *ADL status in stroke: Relative merits of three standard indexes.* Archives of Physical Medicine and Rehabilitation. Vol.61, pp.355-358.

Gupta A. (2008) *Measurement scales used in elderly care*. Radcliffe Publishing, Oxford UK

Hobart JC, Lamping D, Freeman J, et al (2001) *Evidence-based measurement: Which disability scale for neurologic rehabilitation?* Neurology. Vol. 57, pp.639-644.

Houlden H, Edwards M, McNeil J, et al (2006) *Use of the Barthel Index and the Functional Independence Measure during early inpatient rehabilitation after single incident brain injury.* Clinical Rehabilitation. Vol. 20, pp.153-159.

Hsueh I, Lin J, Jeng J, et al (2002) *Comparison of the psychometric characteristics of the functional independence measure, 5 item Barthel index, and 10 item Barthel index in patients with stroke.* Journal of Neurology, Neurosurgery & Psychiatry. Vol. 73, pp.188-190.

Huybrechts KF, Caro JJ, Huybrechts KF, et al (2007) *The Barthel Index and modified Rankin Scale as prognostic tools for long-term outcomes after stroke: a qualitative review of the literature.* Current Medical Research & Opinion. Vol. 23, pp.1627-1636.

Kalra L., Crome P. (1993) *The role of prognostic scores in targeting stroke rehabilitation in elderly patients.* J Am Geriatr Soc. Vol. 41, pp. 396-400.

Jackson D, Turner-Stokes L, Murray J, et al (2007) *Validation of the Memory and Behavior Problems*

Checklist-1990R for use in acquired brain injury. Brain Injury. Vol. 21, pp.817-824.

Mahoney, F., & Barthel, D. (1965) *Functional evaluation: the Barthel Index.* Maryland State Medical Journal. Vol.14, pp.61-65.

McDowell, I. & Newell, C. (1996) *Measuring Health: A Guide to Rating Scales and Questionnaires*. 2nd Ed. New York, Oxford University Press.

McDowell I (2006) *Measuring Health: A Guide to Rating Scales and Questionnaires (3rd ed.)*. Oxford University Press, USA.

O'Toole, D. M., Goldberg, R. T. & Ryan, B. (1985) *Functional changes in vascular amputee patients: Evaluation by Barthel Index, PULSES Profile and ESCROW Scale.* Archives of Physical Medicine and Rehabilitation. Vol. 66, pp.508-511.

Onishi J, Suzuki Y, Umegaki H, et al (2006) *A Comparison of Depressive Mood of Older Adults in a Community, Nursing Homes, and a Geriatric Hospital: Factor Analysis of Geriatric Depression Scale.* Journal of Geriatric Psychiatry and Neurology. Vol. 19, pp.26-31.

Park J, Hopwood V, White AR, et al (2001) *Effectiveness of acupuncture for stroke: a systematic review.* Journal of Neurology. Vol. 248, pp.558-563.

Pearson (2004) *Assessment of Function in Older Adults.* In Kane RL and Kane RA (eds.) (2004) Assessing older persons: measures, meaning and practical applications. Oxford University Press, USA.

Plantinga E, Tiesinga L, van der Schans C, et al (2006) *The criterion-related validity of the Northwick Park Dependency Score as a generic nursing dependency instrument for different rehabilitation patient groups.* Clinical Rehabilitation. Vol. 20, pp.921-926.

Roth, E. J., Lawler, M. H., & Yarkony, G. M. (1990) *Traumatic Cord Syndrome: Clinical features and functional outcomes.* Archives of Physical Medicine and Rehabilitation, Vol. 71, pp.15-23.

Sackley C, Richardson P, McDonnell K, et al (2005) *The reliability of balance, mobility and self-care measures in a population of adults with a learning disability known to a physiotherapy service.* Clinical Rehabilitation. Vol. 19, No.2, pp.216-223.

Sainsbury A, Seebass G, Bansal A, et al (2005) *Reliability of the Barthel Index when used with older people.* Age & Ageing. Vol. 34, pp.228-232.

Sansoni J, Marosszeky N, Jeon Y-H, et al (2008) *Final Report: Dementia Outcomes Measurement Suite Project.* Centre for Health Service Development, University of Wollongong.

Shah S and Muncer SJ (2003) *A comparison of rehabilitation outcome measures for traumatic brain injury.* OTJR: Occupation, Participation and Health. Vol. 23, pp.2-9.

Sherwood, S. J., Morris, J., Mor, V. & Gutkin, C. (1977) *Compendium of Measures for Describing and Assessing Long Term Care Populations*. Boston, MA: Hebrew Rehabilitation Center for the Aged.

Stepien JM, White H, Wundke R, et al (2006) *The Resident Classification Scale: Is it a valid measure of functional dependence?* Australasian Journal on Ageing. Vol. 25, pp.42-45.

Stone, S. P., Herbert P., Chrisostomou, J., Vessey, C. & Horwood, C. (1993) *The assessment of disability in patients on an acute medical ward for the elderly.* Disability and Rehabilitation. Vol.15, pp.35-37.

Sulter G, Steen G and DeKeyser J (1999) *Use of the Barthel Index and Modified Rankin Scale in Acute Stroke Trials.* Stroke. Vol. 30, pp.1538-1541.

Tuel, S. M., Presty, S. K. Meythaler, J. M., Heinemann, A. W. & Katz, R. T. (1992) *Functional improvement in severe head injury after readmission for rehabilitation.* Brain Injury. Vol. 6, pp.363-372.

van Exel N, Scholte op Reimer W and Koopmanschap M (2004) *Assessment of post-stroke quality of life in cost-effectiveness studies: The usefulness of the Barthel Index and the EuroQoL-5D.* Quality of Life

Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation. Vol. 13, pp. 427-433.

Wade, D. T. (1992). *Measurement in Neurological Rehabilitation Medicine*. Oxford, England: Oxford University Press.

Wade, D. T. & Collin, C. (1988) *The Barthel Index: A standard measure of physical disability*. International Disability Studies. Vol. 10, pp.64-67.

Wood-Dauphinee, S. L., Williams, J. J. & Shapiro, S. H. (1990) *Examining outcome measures in a clinical study of stroke*. Stroke. Vol. 21, pp.731-739.

OARS-IADL

Title: Lawton and Brody IADL Scale / Older American Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire (OMFAQ) – Instrumental Activities of Daily Living Scale and the Lawton and Brody IADL Scale.

Abbreviations: Lawton's, Lawton IADL Scale, OARS-IADL

Author(s) Name: M. Powell Lawton and Elaine M. Brody (Lawton and Brody IADL Scale) Center for the Study of Aging and Human Development, Duke University Medical Center (Contact Dr. Gerda G. Fillenbaum) (OARS-IADL).

*** This review focuses on the upgrade of the Lawton and Brody IADL Scale, the OARS-IADL modification, which is the accepted version of the scale used in Australia (Eagar et al., 2001, Eagar et al., 2006). ***

Author(s) Address: The original authors of the Lawton's are deceased.

Supplied by: Information on the OARS is available online at the Duke University official webpage <http://www.geri.duke.edu/service/oars.htm>

The Lawton and Brody IADL Scale is available freely online at <http://www.abramsoncenter.org/PRI/scales.htm>

Cost: Nil. Proper attribution is requested.

Training requirements: Administered by a trained interviewer or used in a self-report questionnaire.

Purpose: Recommended for use with older people living in the community (Pearson, 2004). It is generally not used in residential care facilities as residents perform few IADLS (Graf, 2008).

Administration time: 5 minutes (Burns et al. 2004).

Instrument Type: A clinical rating scale based on direct or proxy observation (trained interview / observation administration); self report versions are also available (Sansoni et al., 2008).

Structure: The Lawton and Brody IADL instrument consists of 8 items reflecting higher order or instrumental activities of daily living (IADLs). The eight items are: ability to use telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for own medications, ability to handle finances.

While the scale is widely used, there are a few criticism of the original Lawton's scale in the scientific literature. The main one being that gender role stereotypes are present in the original version of Lawton and Brody's IADL instrument (Lawton and Brody, 1969) which excluded scoring items on food preparation, housekeeping and laundering for men (Sansoni et al., 2008; Eagar et al., 2001; Eagar et al., 2006). Other criticisms of the original Lawton's include: that there is an inconsistency in scoring some items (i.e. for some items a 1 score does not mean that the highest performance criteria have been met). This type of 0 or 1 scoring can obscure functional limitation (Pearson, 2004). Eagar et al. (2001) also comments that the scale does not correspond to changes in assistive technologies (e.g. telephone aids) since the scale was developed. Finally the Lawton's is "not useful for the assessment of institutionalized persons" (Pearson 2004, page 36).

The OARS-ADL scale is the preferred modification of the Lawton and Brody IADL scale. "...it is an advance on the Lawton and Brody IADL scale with

improved psychometric properties and less reliance on gender role stereotypes; and it has been adapted for use in primary and community care settings in Australia (see Green et al., 2006)" (Sansoni et al. 2008, pages 19 - 20).

The Older Americans Resources and Services (OARS-IADL) scale by Fillenbaum (1985) is an adaptation of the Lawton and Brody IADL instrument (see Pearson, 2004). It contains seven items: telephone, transportation, shopping, meal preparation, housework, medication management, money management. Each item has a core three point response format: without help, with help or unable. (NB: The "with help" response does not distinguish between help provided by people or help provided by devices, Pearson, 2004).

Eagar et al. (2006) and Green et al. (2006) have adapted this measure as a screening assessment of function in Australia. It includes IADL items on housework, transportation, shopping, medication and money management, with two additional ADL items on walking and bathing.

(NB: Fillenbaum (1985) has also created a 5 item screening instrument - using the items on transportation, shopping, meal preparation, housework, and money management. Gallo et al. (2006) provides a short review of this instrument.)

Scoring:

For the Lawton's each item is scored on a 3, 4, or 5 point scale (scores range between 0 and 1), with higher scores indicating greater severity.

For the OARS-ADL scale, each is score on a three point (0, 1 or 2) response scale. The score range is from 0 (dependent) to 14 (independent). Higher total scores reflect greater dependency (Eagar et al. 2001).

Developed for:

Pearson (2004) recommends using the OARS-IADL as a screening tool to determine the need for services for community dwelling adults (and maybe for discharge planning purposes). The instrument was based on instruments developed in the 1950s and 1960s (see Burns et al., 2004).

The original Lawton's "was the first assessment tool to measure the more complex ADLs that demonstrate a person's ability to adapt to the environment" (page 35).

Graf (2008) in her review of the Lawton IADL scale notes that little psychometric reliability and validity and responsiveness data is available on the scale, since its original publication. She provides a useful clinical interpretation guide. She notes that the scale take about 10-15 minutes to administer and that "current practice is to include all eight items for members of either sex" (Graf, 2008, page 54). Vittengl et al. (2006) examined different ways of scoring the items and producing a total score and they found little practical difference (in terms of validity coefficients) between simpler vs. more complex scoring procedures in their sample. Recent publications using the Lawton's have been reported in the areas of epilepsy after stroke (Claassen et al., 2003), neuropsychological testing (Freilich et al., 2007), awareness in traumatic Brain Injury patients (Cheng et al. 2006), prostate cancer in elderly patients (Terret et al., 2004), stroke patient outcomes (Springer et al., 2009), day-time sleepiness in Alzheimer's disease patients, and neuro-imaging studies (Pohjasvaara et al., 2003; Boyle et al., 2003, 2004). The Lawton's has been used in other cultures and language groups, including France (Lechowski et al., 2008), Singapore (Ng et al., 2006), Hong Kong (Tong and Man, 2002) and Brazil (Mendes-Chiloff et al., 2009). The scale is used along with the Barthel Index in a cohort study of 90 year olds in Barcelona, Spain (the NonaSantfeliu study) (Formiga et al., 2009; Ferrer et al., 2008; Formiga et al., 2007). The instrument has been in used in recent dementia studies examining diagnostic issues and patterns of decline / disease (Boyle et al., 2003,

2004; Formiga et al., 2009; Lechowshi et al., 2008; Jefferson et al., 2008; Hancock and Lerner, 2007). The papers by Jefferson et al. and Hancock and Lerner outline problems with the scale's application for this group of patients.

Normative Data:

Normative data for OARS-IADL adults over the age of 60 or 65 has also been provided for US populations (Fillenbaum, 1988 and 1985, as cited by McDowell, 2006).

Clinical/Reference Data:

A number of clinical studies were found using the OARS-IADL in related clinical areas.

Disease groups:

- *Delirium: Vida et al. (2006)*
- *Elderly psychiatric patients: Proctor et al. (2003)*
- *Heart Failure: Formiga et al. (2006)*
- *Emergency Department visits: Wilber et al. (2006)*
- *Stroke: Mayo et al. (2000)*

Sansoni et al. (2008) highlight a number of studies using the original Lawton's for patients with dementia conditions. They show good comparative validity and measure functional decline.

The OARS- IADL scale has been used in studies examining APOE epsilon4 allele in dementia (see Blazer et al., 2001, as cited by Sansoni et al., 2008). A large study by Njegovan et al. (2001) also used the OARS-IADL scale and examined the relationship between functional decline in terms of ADLs and IADLs and cognitive performance.

Shulman et al. (2006) found that Parkinson's disease patients overestimated their performance on the OARS-IADL when compared to performance tests.

Applications:

The Lawton's was originally presented by Lawton and Brody (1969) with the Physical Self Maintenance Scale (PSMS). The PSMS is a 6 item ADL scale looking at mobility and self-care (personal-care) tasks. (A detailed review of the PSMS is provided by McDowell, 2006.) Lawton continued to develop the ADL and IADL scale and the most up to date version of Lawton's scale is in the Multilevel Assessment Instrument. The whole instrument has been reviewed by McDowell (2006). (This version of the instrument included an additional item on whether one can do one's own handyman work at home.)

Barberger-Gateau et al. (1992) (as cited by Eagar et al., 2001) found that a 4 item version of the Lawton's scale (telephone use, use of transportation, responsibility for medication intake, and handling finances) had good sensitivity and specificity of 0.77 and 0.94 in detecting dementia when compared to MMSE scores. (NB: Though the scale was less accurate for those with mild cognitive impairment.)

Barberger-Gateau et al. (1992) also noted that IADL performance was less likely to be affected by education level (as cited by Eagar et al., 2001).

Ramirez-Diaz et al. (2005) in their comprehensive survey of assessment tools used in Alzheimer Disease Memory Clinics In Europe does not record the impact of the OARS-IADL instrument in relation to use of the updated version of the Lawton's.

Carer and/or**Patient Use of Instrument:**

The OARS-IADL scale is part of the Older Americans' Resource and Services Schedule / Multidimensional Functional Assessment Questionnaire (OARS-MFAQ or OARS). A shorter version of the OARS is known as the Functional Assessment Inventory (FAI) (Pfeiffer). This questionnaire (interviewer administered) was developed at Duke University in the 1970s. Properties of the whole OARS-MFAQ instrument are reviewed by Bowling (2001, 2005). It can be used in the community and nursing home samples (where some items are changed or removed). The whole instrument takes about 45 minutes to administer and should be used with adults 55 years and over (Bowling, 2005). Factor analysis of the instrument tends to confirm the division of items into ADLs and IADLs (Bowling, 2005, McDowell, 2006).

McDowell (2006) comments on the useability of the whole OARS / OMFAQ instrument in terms of allowing for supplementing information from other sources (e.g. carers) during the interview, changes in cut-points for different settings and allowing scope for interpreting ratings – the whole instrument which takes about 45 minutes to complete and includes interviewer assessments or ratings of the key domains discussed with the client.

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	Eagar et al. (2001)	<p>X Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>0.85 for the original scale and 0.86 for the OARS-ADL/ IADL (as cited in Eagar et al. 2001).</p> <p>Vittengl et al. (2006) in their study also report high correlations (0.84-0.88).</p> <p>While McDowell (2006) also reports adequate internal consistency for the OARS-IADL (Cronbach's alpha = 0.68) citing the paper by Reuben, et al. 1995.</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	Pearson (2004) McDowell (2006)	<p>X ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>Pearson (2004) and McDowell (2006) report adequate test-retest reliability (r = 0.71) at 5 weeks for the OARS-IADL scale version.</p> <p>McDowell (2006) recommends testing the reliability and validity of OMFAQ scales with larger samples.</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	Pearson (2004) Burns et al. (2004) McDowell (2006)	<p>X Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p><input type="checkbox"/> No information provided</p> <p><input type="checkbox"/> Not applicable</p>	<p>Pearson (2004, Burns et al. (2004) and McDowell (2006) report high inter-rater reliability of the original scale in the range of 0.85 to 0.94.</p>

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Patients/target groups and experts were involved during item selection and/or item reduction <input type="checkbox"/> Patients/target groups were consulted for reading and comprehension <input type="checkbox"/> No patient/target group involvement <input type="checkbox"/> No information found on content validity <input type="checkbox"/> There is an adequate coverage of relevant domains <input type="checkbox"/> There is limited coverage of relevant domains 	<p>Not applicable – as the OARS-IADL is an attempt to improve on an existing instrument</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>Pearson (2004)</p> <p>Burns et al. (2004)</p> <p>McDowell (2006)</p> <p>Pinsonnault et al. (2009)</p>	<p>X Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <ul style="list-style-type: none"> <input type="checkbox"/> Limited construct validity information reported <input type="checkbox"/> Inadequate or no information on construct validity reported 	<p>Pearson (2004), Burns et al. (2004) and McDowell (2006) report significant validity coefficients for the original scale with ADLs, mental status tests, behaviour and physical health measures.</p> <p>Pearson (2004) and McDowell (2006) report good validity correlations for the OARS-ADL scale with physical and mental health (SF-20).</p> <p>McDowell (2006) reports good correlation between the OARS-IADL scale and other measures of function (SMAF, FSQ). Pinsonnault et al. (2009) also showed significant correlations with the SMAF.</p>
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	<p>Pearson (2004)</p> <p>Fillenbaum (1985)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> No evidence provided/failed a test of dimensionality <input type="checkbox"/> Some evidence provided to support internal structure X Substantial evidence provided to support internal structure 	<p>Five items from the OARS-ADL scale (transportation, shopping, meal preparation, housework, money management) form a Guttman scale (Pearson, 2004).</p> <p>OARS-ADL items and OARS-IADL items were found to load on different factors (Fillenbaum, 1985).</p>

<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Eagar et al. 2001</p> <p>Sansoni et al. 2008</p>	<p>X Correlations with other measures are reported</p> <p><input type="checkbox"/> Correlations not reported</p>	<p>Correlations demonstrated with other measures of physical function (Lawton and Brody, 1969 as cited by Eagar et al., 2001).</p> <p>Reuben et al. (1995) (as cited by Sansoni et al., 2008) reports on the correlation between the OARS-IADL with the modified Katz ($r = 0.33$) and the self-administered SF-36 Physical Functioning scale (PF-10) ($r = 0.36$) for a group of community based older persons.</p> <p>Doble et al. (1997) and Rogers et al. (1994) (cited in Sansoni et al., 2008) show that the OARS-IADL correlates significantly with performance based measures of function (e.g. AMPS) in people with dementia.</p> <p>Stolee et al. (1999) has correlated the OARS-IADL with individualised Goal Attainment Scaling.</p> <p>Njegovan et al. (2001) found a pattern of loss of function with 3MS scores. Those who lost functions (as expressed by OARS items) had lower 3MS scores at 5 years. IADL items were lost at higher 3MS scores than ADL items.</p>
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Wilber et al. (2006)</p>	<p>X Scale differentiates between relevant categories of respondents</p> <p><input type="checkbox"/> No information provided on discriminant validity</p>	<p>Wilber et al. (2006) used the OARS-IADL to show that functional decline contributes to Emergency Department visits.</p>
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>	<p>McDowell (2006)</p>	<p>X Comparison made to criterion measures</p> <p><input type="checkbox"/> Limited comparison with criterion measures provided</p> <p><input type="checkbox"/> No comparison with criterion measures provided</p>	<p>IADL scores were found to predicted mortality rates (Fillenbaum, 1985 as cited by McDowell, 2006).</p> <p>The five items from the OARS-ADL scale (mentioned above under construct: internal structure) were also found to predict mental and physical health status one year later (Fillenbaum, 1985).</p>

<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>	<p>Pearson (2004)</p> <p>Wilson et al. (2009)</p>	<p>X Authors provide 2 or more types of information on interpretability</p> <p><input type="checkbox"/> Authors provide limited information to assist with interpretability</p> <p><input type="checkbox"/> No information provided</p>	<p>Reuben et al. (1995) and Ottenbacher et al. (1994) (as cited by Pearson, 2004) report that the instrument can be used as a screening tool "to determine the need for further assessment in older adults and for resource allocation" (page 37).</p> <p>Wilson et al. (2009) used the OARS-IADL in a study on assistive technology for the elderly and showed significant group differences.</p> <p>Mayo et al. (2000) also found positive results using the OARS-IADL for a randomised trial of stroke patients with or without home rehabilitation and nursing care.</p>
--	---	--	--

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>	<p>Eagar et al. (2001)</p> <p>Eagar et al. (2006)</p> <p>Cheville et al. (2009)</p>	<p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects were detected</p> <p>X Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score</p> <p><input type="checkbox"/> No or limited information provided on floor and ceiling effects</p>	<p>Eagar et al. (2001, 2006) comments that the scale may be subject to floor effects for HACC clients. Eagar et al. (2001) gives the example of the Mode of Transportation item.</p> <p>Ceiling effects were noted for the OARS-ADL scale in a group of patients with metastatic breast cancer (Cheville et al. 2009).</p>
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>	<p>Haywood et al. (2005)</p>	<p><input type="checkbox"/> Hypotheses were formulated and results were in agreement</p> <p><input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard)</p> <p>X No information on sensitivity to change was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful</p> <p>X MCID - No information was provided.</p>	<p>Haywood et al. (2005) in their review of instruments for older people report that there is limited information on responsiveness for the OARS-IADL and a ceiling effect may affect the instrument's precision.</p>

**Cultural Applicability
and Cultural Adaptations:**

Limited information found on this aspect of the OARS-IADL scale. This is necessary as the content of IADL instruments may reflect specific cultural concerns (Fillenbaum, 1985). The scale has been reported to be used in Brazil (Paskulin et al., 2009)

Gender Appropriateness:

Appropriate for use with both genders. The OARS-IADL scale has an improved scoring system over the original Lawton IADL scale.

Age Appropriateness:

Adults

Summary:

The OARS-IADL is an improved version of the Lawton's - the first instrument to measure IADLs (Pearson, 2004). It is a well validated and developed IADL instrument to assess and screen for care needs in older adults (Pearson, 2004).

However, further psychometric information is required, particularly in Australian settings, on test-retest reliability, understanding the scales relationship with the original instrument (e.g. correlation coefficient), discriminative validity for different clinical groups, sensitivity to change, testing with younger people, and testing in CALD and Indigenous communities. McDowell (2006) also outlines the need for more data from large samples. There is a particular need to look at the performance of individual ADL and IADL items in Australia, for example comparing the OARS-Assessment of Daily Living section (15 items on ADL and IADL) with the IADL items in the National HACC Functional Screening instrument (Eagar et al., 2006); Green et al., 2006) and items from Lawton's Multilevel Assessment Instrument (Lawton et al., 1982). McDowell (2006) also argues that we need more information about the use of the scales with cognitively impaired subjects and the response that category "performs the task without help". They may be able to do the tasks but more slowly and less efficiently than others.

Reporter:

Nicholas Marosszeky

Date of report:

April 2010

References

Bowling A (2005) *Measuring health: a review of quality of life measurement scales (3rd ed.)*. Open University Press, Berkshire, England

Boyle PA, Malloy PF, Salloway S, et al (2003) *Executive dysfunction and apathy predict functional impairment in Alzheimer disease*. *American Journal of Geriatric Psychiatry*. Vol. 11, pp.214-221.

Boyle PA, Paul R, Moser D, et al (2003) *Cognitive and neurologic predictors of functional impairment in vascular dementia*. *American Journal of Geriatric Psychiatry*. Vol. 11, pp.103-106.

Boyle PA, Paul RH, Moser DJ, et al (2004) *Executive impairments predict functional declines in vascular dementia*. *Clinical Neuropsychologist*. Vol. 18, pp.75-82.

Burns A, Lawlor B and Craig S (2004) *Assessment scales in old age psychiatry (2nd ed.)*. Taylor & Francis, London.

Cheng SK, Man DW, Cheng SKW, et al (2006) *Management of impaired self-awareness in persons with traumatic brain injury*. *Brain Injury*. Vol. 20, pp.621-628.

Cheville AL, Basford JR, Troxel AB, et al (2009) *Performance of common clinician- and self-report measures in assessing the function of community-dwelling people with metastatic breast cancer.* Archives of Physical Medicine & Rehabilitation. Vol. 90, pp.2116-2124.

Claassen J, Peery S, Kreiter KT, et al (2003) *Predictors and clinical impact of epilepsy after subarachnoid hemorrhage.* Neurology. Vol. 60, pp.208-214.

Doble SE, Fisk JD, MacPherson KM, et al (1997) *Measuring functional competence in older persons with Alzheimer's disease.* International Psychogeriatrics. Vol. 9, pp.25-38.

Eagar K, Owen A, Cromwell D, et al (2001) *Towards a national measure of functional dependency for home and community care services in Australia - Stage 1 report of the HACC Dependency Data Items Project.* Centre for Health Service Development, University of Wollongong.

Eagar K, Owen A, Marosszeky N, et al (2006) *Towards a measure of function for home and community care services in Australia: Part 1 - Development of a Standard National Approach.* Australian Journal of Primary Health. Vol. 12, pp.73-81.

Ferrer A, Formiga F, Ruiz D, et al (2008) *Predictive items of functional decline and 2-year mortality in nonagenarians--the NonaSantfeliu study.* European Journal of Public Health. Vol. 18, pp.406-409.

Fillenbaum GG (1985) *Screening the Elderly A Brief Instrumental Activities of Daily Living Measure.* Journal of American Geriatrics Society. Vol. 33, pp.698-699.

Formiga F, Ferrer A, Mascaro J, et al (2007) *Predictive items of one-year mortality in nonagenarians. The NonaSantfeliu Study.* Ageing-Clinical & Experimental Research. Vol. 19, No.4, pp.265-268.

Formiga F, Ferrer A, Duaso E, et al (2009) *Predictive items of 2-year mortality in nonagenarians with cognitive impairment at baseline: the NonaSantfeliu study.* Archives of Gerontology & Geriatrics. Vol. 48, pp.254-257.

Formiga F, Ferrer A, Sobrino J, et al (2009) *Ambulatory blood pressure monitoring (ABPM) in nonagenarians.* Archives of Gerontology & Geriatrics. Vol. 48, pp.367-371.

Formiga F, Chivite D, Sole A, et al (2006) *Functional outcomes of elderly patients after the first hospital admission for decompensated heart failure (HF). A prospective study.* Archives of Gerontology & Geriatrics. Vol. 43, No.2, pp.175-185.

Freilich BM, Hyer LA, Freilich BM, et al (2007) *Relation of the Repeatable Battery for Assessment of Neuropsychological Status to measures of daily functioning in dementia.* Psychological Reports. Vol. 101, pp.119-129.

Gallo JJ, Bogner HR, Fulmer T, et al (2006) *Handbook of geriatric assessment (4th ed.).* Jones and Bartlett Publications Boston.

Graf C and Graf C (2008) *The Lawton instrumental activities of daily living scale.* American Journal of Nursing. Vol. 108, pp.52-62.

Green J, Eagar K, Owen A, et al (2006) *Towards a measure of function for home and community care services in Australia: Part 2 - Evaluation of the Screening Tool and Assessment Instruments.* Australian Journal of Primary Health. Vol. 12, pp.82-90.

Hancock P and Lerner AJ (2007) *The diagnosis of dementia: diagnostic accuracy of an instrument measuring activities of daily living in a clinic-based population.* Dementia & Geriatric Cognitive Disorders. Vol. 23, pp.133-139.

Haywood KL, Garratt AM, Fitzpatrick R, et al (2005) *Older people specific health status and quality of life: a structured review of self-assessed instruments.* Journal of Evaluation in Clinical Practice. Vol. 11, pp.315-327.

Jefferson AL, Byerly LK, Vanderhill S, et al (2008) *Characterization of activities of daily living in individuals with mild cognitive impairment.* American Journal of Geriatric Psychiatry. Vol. 16, pp.375-383.

Lawton M and Brody E (1969) *Assessment of older people: Self-maintaining and instrumental activities in daily living*. Gerontologist. Vol. 9, pp.179-186.

Lawton MP, Moss M, Fulcomer M, et al. (1982) *A research and service oriented Multilevel Assessment Instrument*. J Gerontol. Vol. 37, pp. 91-99.

Lechowski L, de Stampa M, Denis B, et al (2008) *Patterns of loss of abilities in instrumental activities of daily living in Alzheimer's disease: the REAL cohort study*. Dementia & Geriatric Cognitive Disorders. Vol. 25, pp.46-53.

Mayo NE, Wood-Dauphinee S, Cote R, et al (2000) *There's no place like home: an evaluation of early supported discharge for stroke*. Stroke. Vol. 31, pp.1016-1023.

Mendes-Chiloff CL, Torres AR, Lima MC, et al (2009) *Prevalence and correlates of cognitive impairment among the elderly in a general hospital*. Dementia & Geriatric Cognitive Disorders. Vol. 28, pp.442-448.

Njegovan V, Man-Son-Hing M, Mitchell SL, et al (2001) *The hierarchy of functional loss associated with cognitive decline in older persons*. The Journals of Gerontology: Series A: Biological Sciences and Medical Sciences. Vol. 56A, pp.M638-M643.

Paskulin L, Vianna L and Molzahn AE (2009) *Factors associated with quality of life of Brazilian older adults*. International Nursing Review. Vol. 56, pp.109-115.

Paulino Ramirez Diaz S, Gil Gregorio P, Manuel Ribera Casado J, et al (2005) *The need for a consensus in the use of assessment tools for Alzheimer's disease: the Feasibility Study (assessment tools for dementia in Alzheimer Centres across Europe), a European Alzheimer's Disease Consortium's (EADC) survey*. International Journal of Geriatric Psychiatry. Vol. 20, pp.744-748.

Pearson (2004) *Assessment of Function in Older Adults*. In Kane RL and Kane RA (eds.) (2004) Assessing older persons: measures, meaning and practical applications. Oxford University Press, USA.

Pinsonnault E, Dubuc N, Desrosiers J, et al (2009) *Validation study of a social functioning scale: The social-SMAF (social-Functional Autonomy Measurement System)*. Archives of Gerontology and Geriatrics. Vol. 48, pp.40-44.

Pohjasvaara T, Mantyla R, Ylikoski R, et al (2003) *Clinical features of MRI-defined subcortical vascular disease*. Alzheimer Disease & Associated Disorders. Vol. 17, pp.236-242.

Proctor EK, Morrow-Howell NL, Dore P, et al (2003) *Comorbid medical conditions among depressed elderly patients discharged home after acute psychiatric care*. American Journal of Geriatric Psychiatry. Vol. 11, pp.329-338.

Reuben DB, Valle LA, Hays RD, et al (1995) *Measuring physical function in community-dwelling older persons: a comparison of self-administered, interviewer-administered, and performance-based measures*. Journal of the American Geriatrics Society. Vol. 43, pp.17-23.

Sansoni J, Marosszeky N, Jeon Y-H, et al (2008) *Final Report: Dementia Outcomes Measurement Suite Project*. Centre for Health Service Development, University of Wollongong.

Shulman LM, Pretzer-Aboff I, Anderson KE, et al (2006) *Subjective report versus objective measurement of activities of daily living in Parkinson's disease*. Movement Disorders. Vol. 21, pp.794-799.

Springer MV, Schmidt JM, Wartenberg KE, et al (2009) *Predictors of global cognitive impairment 1 year after subarachnoid hemorrhage*. Neurosurgery. Vol. 65, pp.1043-1050.

Stolee P, Stadnyk K, Myers AM, et al (1999) *An individualized approach to outcome measurement in geriatric rehabilitation*. Journals of Gerontology Series A-Biological Sciences & Medical Sciences. Vol. 54, pp.M641-7.

Terret C, Albrand G, Droz JP, et al (2004) *Geriatric assessment in elderly patients with prostate cancer*. Clinical Prostate Cancer. Vol. 2, pp.236-240.

Tong AY and Man DW (2002) *The validation of the Hong Kong Chinese version of the Lawton Instrumental Activities of Daily Living Scale for institutionalized elderly persons.* OTJR: Occupation, Participation and Health. Vol. 22, pp.132-142.

Vida S, Galbaud du Fort G, Kakuma R, et al (2006) *An 18-month prospective cohort study of functional outcome of delirium in elderly patients: activities of daily living.* International Psychogeriatrics. Vol. 18, pp.681-700.

Vittengl J, White C, McGovern RJ, et al. (2006) *Comparative validity of seven scoring systems for the Instrumental Activities of Daily Living scale in rural elders.* Aging & Mental Health. Vol. 10, pp.33-39.

Wilber ST, Blanda M, Gerson LW, et al (2006) *Does functional decline prompt emergency department visits and admission in older patients?* Academic Emergency Medicine. Vol. 13, pp.680-682

Wilson DJ, Mitchell JM, Kemp BJ, et al (2009) *Effects of assistive technology on functional decline in people aging with a disability.* Assistive Technology. Vol. 21, pp.208-217.

Attachment 5: Instrument Reviews for Cognitive Function

Standardised Mini Mental State Examination

Title:	Standardized Mini-Mental State Examination
Abbreviations:	SMMSE or S-MMSE
Author(s) Name:	Prof. D. William Molloy
Author(s) Address:	St. Peter's Centre for Studies in Aging St. Peters Hospital 88 Maplewood Avenue Hamilton Ontario L8M 1W9 Canada
Supplied by:	The instrument is available from the authors and can be used with their permission.
Cost:	The User's Guide can be purchased from Dr Molloy. Costs apply to regional or national use by organizations although it is relatively inexpensive. Costs may apply to individual users.
Training requirements:	Users need to be familiar with the paper by Molloy and Standish (1997). A training video and guide is also available (Vertesi et al., 2001).
Purpose:	Rating of Cognitive Functioning (Burns et al., 2004)
Administration time:	Approximately 10 minutes (less time than the MMSE) (Burns et al., 2004)
Instrument Type:	Interviewer administered cognitive rating scale
Structure:	<p>The SMMSE, like the MMSE, contains 12 items that assess orientation, memory, attention, calculation, language and constructional ability. It involves verbal responses and the ability to respond to verbal and written commands (Pangman et al., 2000).</p> <p>This version of the MMSE includes specific examples of how to score the figures and spelling WORLD backwards. Alternative questions are also provided for repeated testing (Burns et al., 2004).</p> <p>Pangman et al. (2000) outlines the three key differences between the SMMSE and the MMSE. They include: Omitting the serial 7s and replacing it by spelling WORLD and then spelling it backwards; uses specific sequencing for the orientation items; and attaching a time frame to each task.</p>
Scoring:	<p>Scores range from 0 to 30 points. Lower scores indicate greater impairment.</p> <p>Scores of 23 or lower are traditionally indicative of cognitive impairment (Pangman et al., 2000; Srikanth et al., 2006).</p> <p>Vertesi et al. (2001) outlines the following scoring interpretation for assessing cognitive impairment:</p> <p style="padding-left: 40px;">30 = No impairment</p> <p style="padding-left: 40px;">26 – 30 = Considered normal</p>

20 – 25 = Mild

10 – 19 = Moderate

0 – 9 = Severe

Developed for:

A commonly used adaptation of the Mini-Mental State Examination is the Standardised Mini-Mental State Examination (Molloy, Alemayehu and Roberts, 1991). It was developed to overcome the wide variability in administering and scoring the MMSE (Burns et al., 2004). This version improves the consistency in administering and scoring of the MMSE. It includes explanatory questions, time restrictions for answering the questions and detailed scoring instructions.

Normative Data:

Limited normative information is available. Mean results for a control group of 111 people with normal cognitive function (according age and education level) is provided by Molloy, et al. 2005. Information about score distributions or ranges (eg. standard deviation) was not provided.

Clinical/Reference Data:

A number of clinical studies were found, including clinical trials of dementia medication.

Disease groups:

- Chronic obstructive pulmonary disease – Ozge et al. (2006)
- Alcoholism: Shahpesandy et al. (2006)
- First onset of psychosis in the elderly: Hassett (1999)
- Stroke: Srikanth et al. (2006)
- Diagnosis of Mild Cognitive Impairment (MCI): Kupferschmidt et al. (2006)
- Men’s Health (70-89 years) – Serum free testosterone: Yeap et al. (2008)

Treatment studies:

Drug Treatments:

- Donepezil (Relkin et al., 2003; Feldman et al., 2003; Feldman et al., 2005; Gauthier et al., 2002).
- The SMMSE is also being used in the DOMINO-AD protocol studying the effects of donepezil and memantine (see Jones et al., 2009).

The scale has also been used to evaluate the outcomes from a Memory Clinic (Lindner et al., 2001) and is used in a telemedicine protocol (Loh et al., 2007).

Applications:

See the individual validity papers. The paper by Vertesi et al. (2001) provides detailed clinical interpretation guidelines. This includes looking at the relationship between different scale items and scores (i.e. pattern analysis) with the following diseases: Alzheimer’s disease, Vascular Dementia, Dementia with Lewy bodies, and Depression. Descriptions of the relationship between SMMSE scores and functional and cognitive impairment are also provided.

Vertesi et al. (2001) advises how the SMMSE can be adapted for people with physical impairments (for example, problems with a person's dominant hand due to stroke, or problems due to blindness). It also outlines the effects of education level and language ability on resultant scores and their correct interpretation.

Pangman et al. (2000) criticise the SMMSE for its timing criteria and argue that a patient's physical disability may affect their speed in responding to questions – leading to confusion in which ability (cognition or physical disability) is being measured. Spelling WORLD backwards may also be affected by performance anxiety (i.e. that performance anxiety does not just apply to the serial 7s task). The sequencing of the orientation tasks may help the patient in guess the correct response.

A review of some clinical papers also finds different cut-points for cognitive impairment to those presented above. For example:

- Moderate to severe AD = 5-17 points (Feldman et al., 2003)
- Severe AD = 5-12 points (Feldman et al., 2005)
- Moderate AD = 10-17 points (Gauthier et al., 2002)
- Moderate to severe AD = 5-13 points (Jones et al., 2009)
- Mild AD = 19-24 points (Ward et al., 2002)
- Moderate AD = 10-18 points (Ward et al., 2002)

**Carer and/or
Patient Use of Instrument:**

The 3MS or Modified Mini Mental State Examination is a “slightly expanded” version of SMMSE (Burns et al., 2004). For further information on this version of the MMSE see Sansoni et al. (2008).

Molloy and Standish have developed a new shorter instrument, the AB Cognitive Screen (ABCS) (Molloy et al., 2005) for screening mild cognitive impairment. It takes about 3 minutes to administer and score. They have also developed a short screen for depression (Molloy et al., 2006).

Sorensen et al. (2001) have developed an empirical weighting system to score the SMMSE (as opposed to ordinal scoring) which also incorporates missing data. This approach has important research implications.

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	<p>Pangman et al. (2000)</p>	<p><input checked="" type="checkbox"/> Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>Cronbach's alpha was found to be over 0.8 (Pangman et al., 2000).</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	<p>Pangman et al. (2000)</p> <p>Vertesi et al. (2001)</p>	<p><input checked="" type="checkbox"/> ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>Correlations of 1 week test-retest reliability were found to be positive and high (0.90 – 0.97) (n = 28) (Pangman et al., 2000).</p> <p>Vertesi et al. (2001) comments that patients can be retested every 6 -12 months.</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	<p>Molloy and Standish (1997)</p> <p>Vertesi et al. (2001)</p>	<p><input checked="" type="checkbox"/> Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p><input type="checkbox"/> No information provided</p> <p><input type="checkbox"/> Not applicable</p>	<p>In a study with 48 elderly patients and student raters, assessed on 3 occasions one week apart, the interclass correlation when the SMMSE was used rose from 0.69 to 0.90 (Molloy et al., 1991, as cited in Molloy and Standish 1997).</p> <p>Bedard et al. (1995) (as cited in Molloy and Standish 1997 and Vertesi et al., 2001) demonstrated equivalent reliability when administered in home or clinic settings (ICC: 0.86 = home; 0.92 = clinic).</p>

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Patients/target groups and experts were involved during item selection and/or item reduction <input type="checkbox"/> Patients/target groups were consulted for reading and comprehension <input type="checkbox"/> No patient/target group involvement <input type="checkbox"/> No information found on content validity <input type="checkbox"/> There is an adequate coverage of relevant domains <input type="checkbox"/> There is limited coverage of relevant domains 	<p>Not applicable – as the SMMSE is an attempt to improve on an existing instrument.</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>Pangman et al. (2000)</p>	<p>X Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <ul style="list-style-type: none"> <input type="checkbox"/> Limited construct validity information reported <input type="checkbox"/> Inadequate or no information on construct validity reported 	<p>The correlation between MMSE and SMMSE = 0.80 – 0.96 (n = 28) (Pangman et al., 2000).</p>
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>		<p>X No evidence provided/failed a test of dimensionality</p> <ul style="list-style-type: none"> <input type="checkbox"/> Some evidence provided to support internal structure <input type="checkbox"/> Substantial evidence provided to support internal structure 	<p>No information found.</p>
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Souder et al. (1999)</p> <p>Goring et al. (2004)</p>	<p>X Correlations with other measures are reported</p> <ul style="list-style-type: none"> <input type="checkbox"/> Correlations not reported 	<p>Goring, et al. (2004) reports that the SMMSE correlates 0.83 with the six item Orientation-Memory-Concentration (OMC) test.</p> <p>Souder et al. (1999) presented data comparing the SMMSE with different scoring criteria for the Clock Drawing Test.</p>
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of</p>	<p>Field et al. (1995)</p> <p>Molly and Standish (1997)</p>	<p>X Scale differentiates between relevant categories of respondents</p> <ul style="list-style-type: none"> <input type="checkbox"/> No information provided on discriminant validity 	<p>Field et al. (1995) demonstrated that the SMMSE was able to discriminate between elderly patients with</p>

<p>respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Vertesi et al. (2001)</p>		<p>dementia or delirium and those with functional psychiatric disorders (using the Hamilton Rating Scale for Depression).</p> <p>Molloy et al. 1991b (as cited by Vertesi et al. 2001) reports a moderate ICC with the Dysfunctional Behaviour Rating Instrument (DBRI) $r = -0.43$ (n=184 older adults).</p> <p>Molloy et al. 1996 (as cited in Molloy and Standish, 1997 and Vertesi et al., 2001) demonstrated that the SMMSE could differentiate between those older adults who could and could not complete an advance directive ($r = 0.94$).</p>
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>		<p><input checked="" type="checkbox"/> Comparison made to criterion measures</p> <p><input type="checkbox"/> Limited comparison with criterion measures provided</p> <p><input type="checkbox"/> No comparison with criterion measures provided</p>	<p>See the section on Construct Validity.</p>
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>	<p>Ward et al. (2002)</p>	<p><input type="checkbox"/> Authors provide 2 or more types of information on interpretability</p> <p><input checked="" type="checkbox"/> Authors provide limited information to assist with interpretability</p> <p><input type="checkbox"/> No information provided</p>	<p>Ward et al. (2002) described the cognitive decline of a group of 206 patients with mild (and moderate AD using the SMMSE.</p>

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>	Vertesi et al. (2001)	<input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects were detected <input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score <input checked="" type="checkbox"/> No or limited information provided on floor and ceiling effects	Vertesi et al. (2001) notes a ceiling effect for people with early dementia and those with mild cognitive changes.
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>	<p>Lindner et al. (2001)</p> <p>Gauthier et al. (2002)</p> <p>Relkin et al. (2003)</p> <p>Feldman et al. (2005)</p>	<input checked="" type="checkbox"/> Hypotheses were formulated and results were in agreement <input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard) <input type="checkbox"/> No information on sensitivity to change was provided <input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful <input type="checkbox"/> MCID - No information was provided.	<p>Significant scores (when compared to placebo patients) noted by Gauthier et al. (2002) and Feldman et al. (2005) for patients with moderate and severe AD treated with Donepezil. Relkin et al. (2003) found small but significant gains for mild / moderate / probable / possible AD patients in their open label community trial.</p> <p>Lindner et al. (2001) also found positive changes when the SMMSE was used as an outcome measure.</p>

Cultural Applicability and Cultural Adaptations:

French, German, Italian and Spanish versions are available (Molloy and Standish 1997). The SMMSE has been used in an epidemiological study in Turkey (Keskinoglu et al., 2006) and in Danish nursing homes (Sorensen, et al., 1998; Sorensen, et al., 2001).

Vertesi et al. (2001) advises caution when using the scale for people from non-english speaking backgrounds. They also comment that the use of interpreters with patients or the use of alternative approaches for aphasic patients has not been tested.

Gender Appropriateness:

Appropriate for use with both genders.

Age Appropriateness:

This scale has been designed for the geriatric population (Burns 2004).

Summary:

The SMMSE is an important attempt to overcome the wide variability in administering and scoring of the MMSE. The standardised instrument demonstrates improved inter-rater reliability and high correlations with the

original scale. However, there is limited evidence on the SMMSE when compared to the MMSE or 3MS.

Issues requiring further investigation include: developing age-related population norms; determining appropriate cut-points for cognitive impairment; possible ceiling effects in the instrument; an examination of the interpretability of scores in relation to the effects of performance anxiety, sequencing the orientation items, and applying time limits to tasks for people with physical impairments; providing sensitivity to change statistics for the SMMSE and its internal factor structure in relation to the MMSE; appropriate use of the scale with people from CALD and indigenous backgrounds; and an analysis of the benefits and feasibility of using the instrument outside the research context.

Reporter: Nicholas Marosszeky

Date of report: April 2010

References

Burns A, Lawlor B and Craig S (2004) *Assessment scales in old age psychiatry (2nd ed.)*. Taylor & Francis, London.

Feldman H, Gauthier S, Hecker J, et al (2003) *Efficacy of donepezil on maintenance of activities of daily living in patients with moderate to severe Alzheimer's disease and the effect on caregiver burden.* [Erratum appears in *J Am Geriatr Soc.* 2003 Sep;51(9):1331]. Journal of the American Geriatrics Society. Vol. 51, pp.737-744.

Feldman H, Gauthier S, Hecker J, et al (2005) *Efficacy and safety of donepezil in patients with more severe Alzheimer's disease: A subgroup analysis from a randomized, placebo-controlled trial.* International Journal of Geriatric Psychiatry. Vol. 20, pp.559-569.

Field SJ, Jackson HJ, Hassett AM, et al (1995) *Ability of the Mini-Mental State Examination to discriminate diagnostic entities in a psychogeriatric population.* International Journal of Geriatric Psychiatry. Vol. 10, pp.47-53.

Gauthier S, Feldman H, Hecker J, et al (2002) *Functional, cognitive and behavioral effects of donepezil in patients with moderate Alzheimer's disease.* Current Medical Research & Opinion. Vol. 18, pp.347-354.

Goring H, Baldwin R, Marriott A, et al (2004) *Validation of short screening tests for depression and cognitive impairment in older medically ill inpatients.* International Journal of Geriatric Psychiatry. Vol. 19, pp.465-471.

Hassett A (1999) *A descriptive study of first presentation psychosis in old age.* Australian and New Zealand Journal of Psychiatry. Vol. 33, pp.814-824.

Jones R, Sheehan B, Phillips P, et al (2009) *DOMINO-AD protocol: donepezil and memantine in moderate to severe Alzheimer's disease - a multicentre RCT.* Trials. Vol. 10, pp.57.

Keskinoglu P, Giray H, Picakciefe M, et al (2006) *The prevalence and risk factors of dementia in the elderly population in a low socio-economic region of Izmir, Turkey.* Archives of Gerontology & Geriatrics. Vol. 43, pp.93-100.

Kupferschmidt AL, Lewis DL, Molloy D, et al (2006) *Using duration of memory loss to improve differentiation of mild cognitive impairment from normal cognition.* International Journal of Geriatric Psychiatry. Vol. 21, pp.189-190.

Lindner K, Bedard M, Molloy D, et al (2001) *Changes in medication use and functional status of community-dwelling Alzheimer's patients after consultation at a memory clinic.* Clinical Gerontologist: The Journal of Aging and Mental Health. Vol. 22, pp.13-21.

Loh P-K, Donaldson M, Flicker L, et al (2007) *Development of a telemedicine protocol for the diagnosis of Alzheimer's disease*. Journal of Telemedicine and Telecare. Vol. 13, pp.90-94.

Molloy D, Alemayehu E and Roberts R (1991) *Reliability of a standardized Mini-Mental State Examination compared with the traditional Mini-Mental State Examination*. The American Journal of Psychiatry. Vol. 148, pp.102-105.

Molloy D and Standish TI (1997) *A guide to the Standardized Mini-Mental State Examination*. International Psychogeriatrics. Vol. 9, pp.87-94.

Molloy D, Standish TI and Lewis DL (2005) *Screening for Mild Cognitive Impairment: Comparing the SMMSE and the ABCS*. The Canadian Journal of Psychiatry / La Revue canadienne de psychiatrie. Vol. 50, pp.52-58.

Molloy D, Standish TI, Dubois S, et al (2006) *A short screen for depression: The AB Clinician Depression Screen (ABCDS)*. International Psychogeriatrics. Vol. 18, pp.481-492.

Ozge C, Ozge A, Unal O, et al (2006) *Cognitive and functional deterioration in patients with severe COPD*. Behavioural Neurology. Vol. 17, pp.121-130.

Pangman VC, Sloan J and Guse L (2000) *An examination of psychometric properties of the mini-mental state examination and the standardized mini-mental state examination: implications for clinical practice*. Applied Nursing Research. Vol. 13, pp.209-213.

Relkin NR, Reichman WE, Orazem J, et al (2003) *A large, community-based, open-label trial of donepezil in the treatment of Alzheimer's disease*. Dementia & Geriatric Cognitive Disorders. Vol. 16, pp.15-24.

Sansoni J, Marosszeky N, Jeon Y-H, et al (2008) *Final Report: Dementia Outcomes Measurement Suite Project*. Centre for Health Service Development, University of Wollongong.

Shahpesandy H, Pristasova J, Janikova Z, et al (2006) *Alcoholism in the elderly: a study of elderly alcoholics compared with healthy elderly and young alcoholics*. Neuroendocrinology Letters. Vol. 27, pp.651-657.

Sorensen LU, Foldspang A, Gulmann NC, et al (2001) *Empirical weighting of the Standardized Mini Mental State Examination items among nursing home residents*. Nordic Journal of Psychiatry. Vol. 55, pp.49-54.

Souder E, O'Sullivan P and Pechenik G (1999) *Comparison of scoring criteria for Clock Drawing Test*. Journal of Clinical Geropsychology. Vol. 5, pp.139-145.

Sorensen L, Foldspang A, Gulmann NC, et al (1998) *Concurrent validity of the GMS-AGECAT (A3) package in a Danish nursing home population*. International Journal of Geriatric Psychiatry. Vol. 13, pp.336-342.

Srikanth V, Thrift AC, Fryer JL, et al (2006) *The validity of brief screening cognitive instruments in the diagnosis of cognitive impairment and dementia after first-ever stroke*. International Psychogeriatrics. Vol. 18, pp.295-305.

Vertesi A, Lever JA, Molloy DW, et al (2001) *Standardized Mini-Mental State Examination. Use and interpretation*. Canadian Family Physician. Vol. 47, pp.2018-2023.

Ward A, Caro JJ, Kelley H, et al (2002) *Describing cognitive decline of patients at the mild or moderate stages of Alzheimer's disease using the Standardized MMSE*. International Psychogeriatrics. Vol. 14, pp.249-258.

Yeap BB, Almeida OP, Hyde Z, et al (2008) *Higher serum free testosterone is associated with better cognitive function in older men, while total testosterone is not*. *The Health In Men Study*. Clinical Endocrinology. Vol. 68, pp.404-412.

Modified Mini-Mental State (3MS) Examination

Note: This review from the Dementia Outcomes Measurement Suite project is reprinted with the permission of the authors (Sansoni et al., 2008).

Title:	Modified Mini-Mental State (3MS) Examination.
Abbreviations:	3MS ¹ .
Author(s) Name:	Teng, EL & Chui, HC.
Author(s) Address:	Professor Evelyn Teng Department of Neurology, University of Southern California Keck School of Medicine, Los Angeles, CA, USA Phone: (626) 796-6057 E-mail: eteng@usc.edu Professor Helena C. Chui Chair, Department of Neurology Raymond and Betty McCarron Chair in Neurology University of Southern California Keck School of Medicine 410 Keith Mayer Building, 1975 Zonal Avenue Los Angeles, California 90033-4606 Phone: (323) 442-7686 E-mail: chui@usc.edu
Supplied by:	Instrument and training aids are available from Dr E. Teng and H. Chui. The 3 MS can also be reproduced from the original paper, with the authors' permission, which explains administration and scoring methods for both the MMSE and the 3MS scores.
Cost:	Free with authors' permission ² (all qualified health-care professionals can use the 3MS free of charge in their research and clinical practice. Training aids include a manual, a record form, two forms of quizzes for qualifying users on the correct administering and scoring of the 3MS, and scoring keys on the quizzes. These are in WORD files. For parties interested in obtaining these materials, a modest contribution to the authors' research fund is requested in order to help defray the development and handling costs).
Training requirements:	No formal training is needed; however it is recommended that the interviewer gain mastery over the administration and scoring of the instrument based on the original paper (Teng and Chui, 1987) and Teng's unpublished training aids.
Purpose:	To assess a global cognitive function in adults including orientation, registration, recall, simple language, and construction. It was developed to address shortcomings of the Mini-Mental State Exam (MMSE) (Folstein, Folstein, et al. 1975)- to improve reliability and validity of the scores, minimise the floor/ceiling effect, and to enhance discrimination of various levels of cognitive abilities among people with cognitive impairment and dementia.

1 There are other versions of the MMSE also known as the Modified Mini-Mental State Exam. They are not necessarily the same as the 3MS.

2 This needs to be confirmed because the 3MS is derived from the MMSE Folstein MF, Folstein SE et al. (1975). "Mini-Mental State: A practical method for grading the cognitive state of patients for clinicians." *Journal of Psychiatric Research* 12: 189-198. which is copyrighted by Psychological Assessment Resources, Inc. and costs about US\$1, including examination forms, guides and software, per test. It is yet to be confirmed how this impacts on the use of and the cost for the 3MS, which is a modified version of the MMSE.

Administration time:	10 minutes.
Instrument Type:	A brief quantitative assessment of cognitive function as assessed by the patient responses to questions and answers rated by a skilled interviewer.
Structure:	The 3MS consists of 27 items/questions ³ (an extra 8 items have been added to the 19 items of the MMSE) under 15 domains, including date and place of birth (5 points), registration (3 points), mental reversal (7 points), first recall (9 points), temporal orientation (15 points), spatial orientation (5 points), naming (5 points), four-legged animals (10 points), similarities (6 points), repetition (3 points), read and obey “close your eyes” (5 points), three-stage command (3 points), writing (5 points), copying two pentagons (10 points), and second recall (9 points). The domains are designed to assess the individual’s cognitive capacity in terms of orientation to time and place, attention, concentration, long- and short-term memory, language ability, constructional praxis, and abstract thinking.
Scoring:	Each correct answer to the item yields a score (see above), and the item scores are summed to provide a global score ranging from 0-100 (compared to the MMSE ranging from 0-30). Higher scores indicate better cognitive performance, and cutting points range between 76 and 80. A single administration of the 3MS, with the addition of a few extra questions, can produce the scores for both the MMSE and the 3MS. The 3MS is a more finely graded scoring system than the MMSE scoring system, which allowed dichotomously scored responses only. This means there is room for attaining more marks for nearly accurate answers when using the 3MS.
Developed for:	The original MMSE was developed to assess the cognitive status of older patients in clinical settings. The 3MS was developed to improve validity and reliability of the MMSE by adding items and extending the scoring precision to screen for both dementia and cognitive impairment. The 3MS test has been used extensively in both community and institutional settings.
Normative Data:	Normative data, based on age (older populations) and education, have been reported in general population-based studies (Tombaugh, McDowell, et al., 1996, Jones, Schinka et al., 2002) and, in particular, population focused studies such as for an elderly African American population (Brown, Schinka, et al. 2003) and for a non-demented elderly population (Bravo and Hebert, 1997; Tschanz, Welsh-Bohmer et al., 2002). Jones, et al.’s study (2002) also offered adjustments for age and education, which aimed to improve sensitivity and specificity in detecting dementia. Whilst adjustments for age, education and sensory impairment resulted in improved sensitivity and specificity to screen for dementia (Khachaturian, Gallo et al., 2000; Hayden, Khachaturian et al., 2003), findings from a large population-based study showed the use of age and education adjusted normative data resulted in reduced validity of the instrument as well as reducing sensitivity to dementia (O’Connell, Tuokko et al., 2004).
Clinical Data:	The 3MS has been used in numerous clinical studies in the following six categories ⁴ : <p>1) cognitive status/change in general populations or populations with physical or mental illness, without dementia: the primitive reflexes by electrophysiological assessments and their correlation with the cognitive and physical functioning of stroke patients (Chang, 2001); the association between stroke and cognitive function/incident cognitive decline (Suhr and Grace, 1999; Elkins, O’Meara et al., 2004); left carotid artery disease and</p>

³ The total number of the items/questions may be higher when some items are counted in a detailed manner; for example, serial abstracts and spelling “world” backward are counted as ten items, rather than two.

⁴ Some may overlap with other categories. Some of the studies cited used the 3MS as a baseline measure.

cognitive impairment (Johnston, O'Meara et al., 2004); chronic kidney disease and cognitive impairment (Kurella, Chertow et al., 2004; Kurella, Luan et al., 2004; Kurella, Chertow et al., 2005); the association between vision and hearing impairment and subsequent cognitive and functional decline (Lin, Gutierrez et al., 2004); the association between impaired glycaemia/diabetes and cognitive function (Worrall, Moulton et al., 1993; Worrall, Chaulk et al., 1996; Wu, Haan et al., 2003; Shorr, de Rekeneire et al., 2006); various eye movement dysfunctions and cognitive impairment (Rosse, Malhotra et al., 1992; Rosse, Schwartz et al., 1993); the applicability of the self-medication hypothesis in individuals with a dual diagnosis of drug abuse and personality disorder (Castaneda, 1994); the association between depressive symptoms and long-term mortality in hospitalized older persons (Covinsky, Kahana et al., 1999); the relationship between patients' self-reports of depression and anxiety and cognition (Guilmette, Snow et al., 1992); the association between action tremor and the underlying basal ganglia disease in Parkinson's disease (PD) (Louis, Levy et al., 2001); reliability of self-assessed disability in patients with PD (Louis, Lynch et al., 1996); depressive symptoms and white and grey matter lesions (Steffens, Helms et al., 1999); state of well-being, cognition, ambulatory capacity, and dexterity among patients with end stage renal disease (Yavuz, Karata et al., 2000); A comparison of the MMSE and the 3MS in an inpatient psychiatric population (Blais and Baity, 2005).

2) the effects of drugs, both prescribed and supplementary, on cognitive function: Impact of antidiabetic medications on physical and cognitive functioning (Wu, Haan et al., 2003); the association of statin drug use on cognitive change (Bernick, Katz et al., 2005); the association of antihypertensive agents with MRI white matter findings and with the 3MS in older adults (Heckbert, Longstreth et al., 1997); the association between reported alcohol intake and cognition (Espeland, Gu et al., 2005); the effect of hormone/hormone replacement therapy on cognition (Shumaker, Reboussin et al., 1998; Steffens, Norton et al., 1999; Yaffe, Haan et al., 2000; Carlson, Zandi et al., 2001; Rapp, Espeland et al., 2003; Shumaker, Legault et al., 2003; Whitmer, Haan et al., 2003; Espeland, Rapp et al., 2004; Shumaker, Legault et al., 2004); the effect of Rivastigmine on Dementia with Lewy bodies (DLB) (Maclean, Collins et al., 2001); the association between supplemental use of antioxidant vitamins and risk of significant cognitive decline (Maxwell, Hicks et al., 2005); the effect of calcium-channel blockers and cognitive function (Maxwell, Hogan et al., 1999); the effect of cognitive enhancement drug on cognition (Tariska and Paksy, 2000); use of herbal medicine and other dietary supplements (Nahin, Fitzpatrick et al., 2006).

3) the effects of non-pharmacological interventions on cognitive status: the association between physical activity and cognitive function; the significance of music in the lives of senior individuals (Cohen, Bailey et al., 2002); different types of CPR and cognitive outcome (Stiell, Hebert et al., 1996); the adverse cognitive effects of electroconvulsive therapy (Sobin, Sackeim et al., 1995; Sackeim, Luber et al., 2000); the effectiveness of cognitive nursing interventions (Abraham and Reel, 1992).

4) risk factors for dementia/cognitive impairment: the role of APOE genotype in modulating effects of other risk factors for cognitive decline (Haan, Shemanski et al., 1999); the association between low folate status and impaired cognitive function dementia (Ramos, Allen et al., 2005); the relation between total plasma homocysteine concentration and cognitive function (Miller, Green et al., 2003); the predictive utility of olfactory identification deficits in patients with mild cognitive impairment for follow-up diagnosis of probable Alzheimer's disease (AD) (Devanand, Michaels-Marston et al., 2000); the relationship between pantomime recognition and production in patients with AD (Dumont and Ska, 2000); the association between arm length and height and cognitive/functional abilities (Jeong, Kim et al., 2005); socioeconomic differences in cognitive decline and the

role of biomedical factors (Koster, Penninx et al., 2005); the determinants of dementia (Kuller, Shemanski et al., 1998; Kuller, Lopez et al., 2003; Kuller, Lopez et al., 2005); incidence, manifestations, and predictors of worsening white matter grade on serial imaging (Longstreth, Dulberg et al., 2002; Longstreth, Arnold et al., 2005); risk factors for mild cognitive impairment (Lopez, Jagust et al., 2003); glucose tolerance and both AD and vascular dementia (Curb, Rodriguez et al., 1999); comparison of dementia risks factors in terms of education and cognitive capacity between black and white populations (Shadlen, Siscovick et al., 2006).

5) diagnostic, prognostic and screening measures: the relationship of AD with evidence of brain imaging (Marder, Richards et al., 1995; Jagust, Gitcho et al., 2006); clinical characteristics of Binswanger's disease (Merkli, Pal et al., 2001); the relationship between the functional activities and cognitive status (Rockwood, Tripp et al., 1994; Njegovan, Hing et al., 2001; Tabert, Albert, et al. 2002; Rosano, Simonsick, et al. 2005); the effects on global cognitive function and mood of a reduction of brain serotonin (Porter, Lunn et al., 2000; Porter, Phipps et al., 2005); subjective memory loss and development of dementia (St John and Montgomery, 2002); predictors of disease course in AD (Hogan and Ebly, 2000); Screening for mild dementia/cognitive impairment (MacKnight, Graham et al., 1999; Bland and Newman, 2001).

6) epidemiological studies with a particular focus on psychometric properties of the 3MS and/or the correlations between the 3MS and other cognitive measures (Teng and Chui, 1987; Teng, Chui et al., 1990; Lamarre and Patten, 1991; Abraham, Manning et al., 1993; Schulzer, Calne et al., 1993; Osterweil, Mulford et al., 1994; Ebly, Hogan et al., 1995; Grace, Nadler et al., 1995; Cappeliez, Quintal et al., 1996; Graham, Rockwood et al., 1996; Tombaugh, McDowell et al., 1996; Besson and Labbe, 1997; Bravo and Hebert, 1997; Bravo and Hebert, 1997; Graham, Rockwood et al., 1997; McDowell, Kristjansson et al., 1997; Murden and Galbraith, 1997; Bravo, Charpentier et al., 1998; MacKnight, Graham et al., 1999; Norton, Tschanz et al., 1999; Khachaturian, Gallo et al., 2000; Correa, Perrault et al., 2001; Jones, Schinka et al., 2002; Tschanz, Welsh-Bohmer et al., 2002; Bassuk and Murphy, 2003; Brown, Schinka et al., 2003; Rapp, Espeland et al., 2003; Jeong, Cho et al., 2004; Mitsis, 2004; O'Connell, Tuokko et al., 2004; Sambrook, Herrmann et al., 2004; Blais and Baity, 2005; Desrosiers, Rochette et al., 2005; Koster, Penninx et al., 2005; Rankin, Clemons et al., 2005; Tombaugh, 2005).

Applications:

It is used for the evaluation of cognitive function in both primary care/community dwelling and institutional care settings to detect change of cognitive status and cognitive impairment, and monitor response to treatment. People with various diagnostic criteria (e.g., dementia, AD, LBD, non-dementia/cognitively impaired, schizophrenia, depression, and cardiovascular disease) have been assessed using the 3MS. The 3MS has been used in both clinical and epidemiological studies. A couple of studies have been identified for a telephone adaptation of the 3MS (Norton, Tschanz et al., 1999; Alexopoulos, Perneckzy et al., 2006).

Carer and/or

Patient Use of Instrument:

Cognitive rating scale based on performance of set tasks. The 3MS is interviewer rated.

Psychometric Criteria⁵

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale.</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale.</p>	<p>McDowell, Kristjansson et al. (1997)</p> <p>Cappeliez, Quintal, et al. (1996)</p> <p>Nadler, Relkin, et al. (1995)</p> <p>Jeong, Cho, et al. (2004)</p>	<p>X Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>Excellent internal consistency with Cronbach's alpha of 0.87 (compared to 0.78 for the MMSE). Split half reliability was 0.82 (0.76 for the MMSE).</p> <p>In a French version of the 3MS, Cronbach's alpha of 0.80 was reported.</p> <p>Alpha was 0.90 for the 3MS (0.84 for the MMSE).</p> <p>Cronbach's alpha for the Korean version of 3MS (K-mMMSE)⁶ was 0.91, compared to 0.84 for the Korean version of MMSE (K-MMSE).</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	<p>Teng and Chui (1987)</p> <p>Grace, Nadler, et al. (1995)</p> <p>Nadler, Relkin, et al. (1995)</p> <p>Jeong, Cho, et al. (2004)</p> <p>Cappeliez, Quintal, et al. (1996)</p> <p>Correa, Perrault, et al. (2001)</p>	<p>X ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>Excellent test-re-test reliability over delays between 52 and 98 days, with cutting point of 79/80, ranging from 0.91 to 0.93. (compared to 0.79 to 0.89 for the MMSE).</p> <p>One month stability coefficients were 0.8. (0.71 for the MMSE).</p> <p>Retest reliability was 0.92 (0.85 for the MMSE).</p> <p>The K-mMMSE also demonstrated excellent test-retest reliability (0.89) over mean interval delays of 26 days (range 19-32 days).</p> <p>In a French version of the 3MS a 14-day delay of the test-retest reliability coefficient was 0.87</p> <p>A Canadian study of community-dwelling older persons with a diagnosis of dementia indicated a high intraclass correlation coefficient (ICC=0.85).</p> <p>In a two-phase community</p>

5 This section is largely based on the psychometric review of the 3MS by McDowell, I. (2006). *Measuring Health: A guide to Rating Scales and Questionnaires* Oxford, Oxford University Press.

6 K-mMMSE is NOT a Korean version of mMMSE. It is a slightly modified version of the 3MS designed to make the 3MS more suitable to Korean culture and language.

	<p>Bravo and Hebert (1997)</p> <p>Bassuk and Murphy (2003)</p> <p>Correa, Perrault, et al. (2001)</p>		<p>prevalence study the 3MS and the MMSE were implemented by a lay interviewer at first and by a nurse in the second phase (after a median delay of 49 days) an ICC for the 3MS was 0.87 while the MMSE had an ICC of 0.78.</p> <p>A population-based longitudinal study of older people showed an intraclass correlation coefficient of 0.98, as was internal consistency (coefficient alpha=0.91). Test-retest reliability over 3 years was 0.78.</p> <p>The intraclass correlation coefficient was 0.85 (95% confidence interval, CI: 0.81-0.88). Language (either tested in English or in French) did not make much difference as they both showed an ICC of 0.85.</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	<p>Nadler, Relkin, et al. (1995)</p> <p>Bassuk and Murphy (2003)</p>	<p>X Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p><input type="checkbox"/> No information provided</p>	<p>In a study conducted in a long-term care settings both the 3MS and the MMSE showed excellent inter-rater reliability ($r=0.99$).</p> <p>Excellent inter-rater reliability, “free of rater bias” and an intraclass correlation coefficient=0.98).</p>

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>	<p>McDowell (2006)</p>	<p><input type="checkbox"/> Patients and experts were involved during item selection and/or item reduction</p> <p><input type="checkbox"/> Patients were consulted for reading and comprehension</p> <p><input type="checkbox"/> No patient involvement</p> <p>X No information found on content validity</p> <p>X There is an adequate coverage of relevant domains</p> <p><input type="checkbox"/> There is limited coverage of relevant domains</p>	<p>Given the MMSE was derived from existing instruments; it is safe to assume that the most domains of the 3MS originated from the existing theoretical premises.</p> <p>Demonstrated in factor analysis described below, the 3MS appears to measure relevant domains of cognitive function.</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to</p>	<p>Njegovan, Hing, et al. (2001)</p>	<p>X Results were acceptable in accordance with the hypotheses and an</p>	<p>Studies reported moderate to high construct validity in relation to hypothesised domains (functional capability</p>

<p>other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured.</p>	<p>Jeong, Cho, et al. (2004)</p>	<p>adequate comparison measure was used <input checked="" type="checkbox"/> Limited /inadequate construct validity reported <input type="checkbox"/> No information provided</p>	<p>and activities of daily living). Progressive cognitive decline is associated with a specific pattern of loss of functional tasks using instrumental activities of daily living (ADLs) and 14 Older American Resources and Services (OARS) items. The K-mMMSE showed significant correlations ($P < 0.001$ by Pearson's correlation analyses) with Clinical Dementia Rating (CDR), Sum of Boxes of CDR (CDRSB), and Korean Instrumental Activities of Daily Living (KIADL). The correlation coefficient between K-mMMSE and K-MMSE scores was 0.94. According to the CDR scores, the median values of the K-mMMSE and K-MMSE changed significantly.</p>
<p>Construct: Internal Structure Information provided on factor structure</p>	<p>Abraham, Manning, et al. (1993) Cappeliez, Quintal, et al. (1996) Rapp, Espeland, et al. (2003)</p>	<p><input type="checkbox"/> No evidence provided/failed a test of dimensionality <input checked="" type="checkbox"/> Some evidence provided to support internal structure <input type="checkbox"/> Substantial evidence provided to support internal structure</p>	<p>A factor analytic study of the 3MS yielded five domains of psychomotor skills, memory, identification and association, orientation, and concentration and calculation. The solution explained 58.9% of the variance. In the French version of the 3MS test, four factors accounting for 63.2% of the variance were reported. In a clinical trial of hormone therapy for women, four factors (verbal memory with the heaviest loading, language and execution, orientation and language praxis) accounting for 37% of the total variance was reported.</p>
<p>Construct: Correlation with other measures Comparisons made to other measures</p>	<p>Cappeliez, Quintal, et al. (1996) Bassuk and Murphy (2003)</p>	<p><input checked="" type="checkbox"/> Correlations with other measures are reported <input type="checkbox"/> Correlations not reported</p>	<p>Moderate to high correlations with other instruments testing cognition. The 3MS was reported to be correlated with: the MMSE (0.90), the Blessed Dementia Scale (-0.80), the Cambridge Mental Disorders of the Elderly Examination (CAMDEX) Cognitive scale (CAMCOG) (0.85). The correlation between the 3MS and the MMSE scores was 0.95.</p>

	<p>Grace, Nadler, et al. (1995)</p> <p>Rosano, Simonsick, et al. (2005)</p>		<p>The clinical utility study of the 3MS in the stroke population, in comparison with the MMSE, indicates that the 3MS yields consistently higher coefficients than the MMSE: Correlations with Boston Naming Test for language (0.61 for the 3MS and 0.55 for the MMSE); with Controlled Word Association for verbal fluency (0.81 for the 3MS and 0.59 for the MMSE); with the Logical Memory test (0.62 for the 3MS and 0.55 for the MMSE); and with the Functional Independence Measure (0.44 for the 3MS and 0.36 for the MMSE).</p> <p>In a the health, aging and body composition study, physical function measures (gait speed, chair stands, standing balance) were associated with both the 3MS and digit symbol substitution test (DSST) ($p < 0.001$).</p>
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Jones, Schinka, et al. (2002)</p> <p>Jeong, Cho, et al. (2004)</p> <p>McDowell (2006)</p> <p>Teng, Chui, et al. (1990)</p> <p>Rockwood, Tripp, et al. (1994)</p> <p>Jeong, Cho, et al.</p>	<p>X Scale differentiates between relevant categories of respondents</p> <p><input type="checkbox"/> No information on discriminant validity</p>	<p>Studies have shown moderate to high sensitivity and specificity of the 3MS in detecting dementia and severity of cognitive impairment in both community dwellings and long-term institutional settings. This indicates improved construct validity when compared with the MMSE.</p> <p>At a specificity of 0.95, for people with 7 to 12 years of education the 3MS yielded sensitivity of 0.94 compared to sensitivity of 0.88 for the MMSE; for people with 13 or more years of education sensitivity was 0.91 for the 3MS and 0.86 for the MMSE.</p> <p>Whilst the 3MS differentiated people with dementia from people without, it showed less competence for recognising people without cognitive impairment from those with Cognitively Impaired but No Dementia (CIND). This was improved, albeit not significantly, when Physical Function Measures (PFMs) were introduced, along with the 3MS.</p> <p>The areas under the Receiver</p>

	<p>Maxwell, Hogan, et al. (1999)</p> <p>Jagust, Gitcho, et al. (2006)</p>	<p>was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful</p> <p><input type="checkbox"/> MCID – No information was provided.</p>	<p>The 3MS was used to demonstrate change in a global cognitive function significantly higher in the group using calcium channel blockers than in the group using other antihypertensive agents (75% v. 59%).</p> <p>Evidence of temporal and parietal glucose metabolism, using baseline positron emission tomography scans, was reported as a predictive measure for detecting a global cognitive impairment based on the 3MS score.</p>
--	---	---	--

Cultural Applicability and Cultural Adaptations:

Similar to the MMSE, the 3MS in its original format may not be culturally sensitive. However, adaptations /adjustments to the 3MS have been made over the years in various translated versions appropriate to the specific culture, with moderate to high successful outcomes reported, including, French (Cappeliez, Quintal, et al., 1996; Patenaude and Baillargeon, 1996; Bravo and Hebert, 1997; Bravo and Hebert, 1997; Viscogliosi, Desrosiers, et al., 2000), Korean (Jeong, Cho, et al., 2004), German (Sandholzer, Breull, et al., 1999; Alexopoulos, Perneczky, et al., 2006); Nigerian population (Ogunniyi, Osuntokun, et al., 1992; Baker, Ogunniyi, et al., 1995); Hungarian (Tariska and Paksy, 2000; Merkli, Pal, et al., 2001); and Mexican American populations (Miller, Green, et al., 2003; Wu, Haan, et al., 2003; Wu, Haan, et al., 2003).

Gender Appropriateness:

Appropriate for use with both genders. However, for an African American population different norms for male and female may need to be considered (Brown, Schinka et al., 2003). Further research is needed to establish the relationship between gender, ethnicity and normative data for the 3MS.

Age Appropriateness:

No age limitation has been mentioned, and a study reported high concurrent validity and test-retest reliability of the 3MS among children aged between 4 and 12 (Besson and Labbe, 1997). However the 3MS is mainly developed and used for older people (aged 55 and over). Different norms for different age groups have been reported (see above the section for normative data).

Summary:

The Modified Mini-Mental State Exam (3MS) is a highly recommended instrument in assessing a global cognitive status in older people applicable in both community and the institutional settings. It has superior psychometric properties than the MMSE and is extensively used in large scaled epidemiological studies internationally (mostly North American studies). An increasing number of studies use a translated version of the 3MS to achieve cultural appropriateness.

Reporter:

Dr Yun-Hee Jeon

Date of report:

15/01/07

References

- Abraham IL, Manning CA, Boyd MR, Neese JB, Newman MC, Plowfield LA, et al. (1993) *Cognitive screening of nursing home residents: Factor analytic structure of the Modified Mini-Mental State (3MS) examination*. International Journal of Geriatric Psychiatry. Vol. 8, No.2, pp.133-138.
- Abraham IL and Reel SJ (1992) *Cognitive nursing interventions with long-term care residents: effects on neurocognitive dimensions*. Archives of Psychiatric Nursing. Vol. 6, No.6, pp.356-365.
- Alexopoulos P, Pernecky R, Cramer B, Grimmer T and Kurz A (2006) *Validation of a Short Telephone Test (T3MS) for the Diagnosis of Cognitive Impairment*. [German]. Fortschritte der Neurologie-Psychiatrie. Vol. 74, No.6, pp.329-336.
- Baker FM, Ogunniyi A and Osuntokun BO (1995) *A pilot study of dementia in Ibadan, Nigeria*. Journal of Geriatric Psychiatry and Neurology. Vol. 8, No.1, pp.65-70.
- Banerjee S, Smith SC, Lamping DL, Harwood RH, Foley B, Smith P, et al. (2006) *Quality of life in dementia: more than just cognition. An analysis of associations with quality of life in dementia*. Journal of Neurology, Neurosurgery & Psychiatry. Vol. 77, No.2, pp.146-148.
- Bassuk SS and Murphy JM (2003) *Characteristics of the Modified Mini-Mental State Exam among elderly persons*. Journal of Clinical Epidemiology. Vol.56, No.7, pp.622-628.
- Bernick C, Katz R, Smith NL, Rapp S, Bhadelia R, Carlson M, et al. (2005) *Statins and cognitive function in the elderly: the Cardiovascular Health Study*. Neurology. Vol. 65, No.9, pp.1388-1394.
- Besson PS and Labbe EE (1997) *Use of the Modified Mini-Mental State Examination with children*. Journal of Child Neurology. Vol. 12, No.7, pp.455-460.
- Blais MA and Baity MR (2005) *A Comparison of Two Mental Status Examinations in an Inpatient Psychiatric Sample*. Assessment. Vol. 12, No.4, pp.455-461.
- Bland RC and Newman SC (2001) *Mild dementia or cognitive impairment: the Modified Mini-Mental State examination (3MS) as a screen for dementia*. Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie. Vol. 46, No.6, pp.506-510.
- Bravo G, Charpentier M, Dubois MF, DeWals P and Emond A (1998) *Profile of residents in unlicensed homes for the aged in the eastern townships of Quebec*. CMAJ Canadian Medical Association Journal. Vol.159, No.2, pp.143-148.
- Bravo G and Hebert R (1997a) *Age- and education-specific reference values for the Mini-Mental and modified Mini-Mental State Examinations derived from a non-demented elderly population*. International Journal of Geriatric Psychiatry. Vol. 12, No.10, pp.1008-1018.
- Bravo G and Hebert R (1997b) *Reliability of the Modified Mini-Mental State Examination in the context of a two-phase community prevalence study*. Neuroepidemiology. Vol. 16, No.3, pp.141-148.
- Brown LM, Schinka JA, Mortimer JA and Graves AB (2003) *3MS normative data for elderly African Americans*. Journal of Clinical and Experimental Neuropsychology. Vol. 25, No.2, pp.234-241.
- Cappeliez P, Quintal M, Blouin M, Gagne S, Bourgeois A, Finlay M, et al. (1996) *Psychometric properties of the French version of the Modified Mini-Mental State (3MS) in elderly patients evaluated in geriatric psychiatry*. [French]. Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie. Vol. 41, No.2, pp.114-121.
- Carlson MC, Zandi PP, Plassman BL, Tschanz JT, Welsh-Bohmer KA, Steffens DC, et al. (2001) *Hormone replacement therapy and reduced cognitive decline in older women: the Cache County Study*. Neurology. Vol. 57, No.12, pp.2210-2216.
- Castaneda R (1994) *Empirical assessment of the self-medication hypothesis among dually diagnosed inpatients*. Comprehensive Psychiatry. Vol. 35, No.3, pp.180-184.

- Chang CW (2001) *Electrophysiological assessments of primitive reflexes in stroke patients*. Clinical Neurophysiology. Vol. 112, No.6, pp.1070-1075.
- Cohen A, Bailey B and Nilsson T (2002) *The importance of music to seniors*. Psychomusicology. Vol. 18, No.1-2, pp.89-102.
- Correa JA, Perrault A and Wolfson C (2001) *Reliable individual change scores on the 3MS in older persons with dementia: results from the Canadian Study of Health and Aging*. International Psychogeriatrics. Vol. 13, Suppl.1, pp.71-78.
- Covinsky KE, Kahana E, Chin MH, Palmer RM, Fortinsky RH and Landefeld CS (1999) *Depressive symptoms and 3-year mortality in older hospitalized medical patients*. Annals of Internal Medicine. Vol. 130, No.7, pp.563-569.
- Curb JD, Rodriguez BL, Abbott RD, Petrovitch H, Ross GW, Masaki KH, et al. (1999) *Longitudinal association of vascular and Alzheimer's dementias, diabetes, and glucose tolerance*. Neurology. Vol. 52, No.5, pp.971-975.
- Desrosiers J, Rochette A and Corriveau H (2005) *Validation of a new lower-extremity motor coordination test*. Archives of Physical Medicine & Rehabilitation. Vol. 86, No.5, pp.993-998.
- Devanand DP, Michaels-Marston KS, Liu X, Pelton GH, Padilla M, Marder K, et al. (2000) *Olfactory deficits in patients with mild cognitive impairment predict Alzheimer's disease at follow-up*. American Journal of Psychiatry. Vol. 157, No.9, pp.1399-1405.
- Dumont C and Ska B (2000) *Pantomime recognition impairment in Alzheimer's disease*. Brain & Cognition. Vol. 43, No.1-3, pp.177-181.
- Ebly EM, Hogan DB and Parhad IM (1995) *Cognitive impairment in the nondemented elderly. Results from the Canadian Study of Health and Aging*. Archives of Neurology. Vol. 52, No.6, pp.612-619.
- Elkins JS, O'Meara ES, Longstreth WT Jr., Carlson MC, Manolio TA and Johnston SC (2004) *Stroke risk factors and loss of high cognitive function*. Neurology. Vol. 63, No.5, pp.793-799.
- Espeland MA, Gu L, Masaki KH, Langer RD, Coker LH, Stefanick ML, et al. (2005) *Association between reported alcohol intake and cognition: results from the Women's Health Initiative Memory Study.[see comment]*. American Journal of Epidemiology. Vol. 161, No.3, pp.228-238.
- Espeland MA, Rapp SR, Shumaker SA, Brunner R, Manson JE, Sherwin BB, et al. (2004) *Conjugated equine estrogens and global cognitive function in postmenopausal women: Women's Health Initiative Memory Study*. JAMA. Vol. 291, No.24, pp.2959-2968.
- Folstein M, Folstein S and McHugh P (1975) *'Mini-Mental State': a practical method for grading the cognitive state of patients for the clinician*. Journal of Psychiatric Research. Vol. 12, pp.189-198.
- Grace J, Nadler JD, White DA, Guilmette TJ, Giuliano AJ, Monsch AU, et al. (1995) *Folstein vs modified Mini-Mental State Examination in geriatric stroke. Stability, validity, and screening utility*. Archives of Neurology. Vol. 52, No.5, pp.477-484.
- Graham JE, Rockwood K, Beattie BL, Eastwood R, Gauthier S, Tuokko H, et al. (1997) *Prevalence and severity of cognitive impairment with and without dementia in an elderly population*. Lancet. Vol. 349, No.9068, pp.1793-1796.
- Graham JE, Rockwood K, Beattie BL, McDowell I, Eastwood R and Gauthier S (1996) *Standardization of the diagnosis of dementia in the Canadian Study of Health and Aging*. Neuroepidemiology. Vol. 15, No.5, pp.246-256.
- Guilmette TJ, Snow MG, Grace J and Giuliano AJ (1992) *Emotional dysfunction in a geriatric population: staff observations and patients' reports*. Archives of Physical Medicine & Rehabilitation. Vol. 73, No.6, pp.587-593.

- Haan MN, Shemanski L, Jagust WJ, Manolio TA and Kuller L (1999) *The role of APOE epsilon4 in modulating effects of other risk factors for cognitive decline in elderly persons*. JAMA. Vol. 282, No.1, pp.40-46.
- Hayden KM, Khachaturian AS, Tschanz JT, Corcoran C, Nortond M, Breitner JCS, et al. (2003) *Characteristics of a two-stage screen for incident dementia*. Journal of Clinical Epidemiology. Vol. 56, No.11, pp.1038-1045.
- Heckbert SR, Longstreth WT, Jr., Psaty BM, Murros KE, Smith NL, Newman AB, et al. (1997) *The association of antihypertensive agents with MRI white matter findings and with Modified Mini-Mental State Examination in older adults*. Journal of the American Geriatrics Society. Vol. 45, No.12, pp.1423-1433.
- Hogan DB and Eby EM (2000) *Predicting who will develop dementia in a cohort of Canadian seniors*. Canadian Journal of Neurological Sciences. Vol. 27, No.1, pp.18-24.
- Jagust W, Gitcho A, Sun F, Kuczynski B, Mungas D and Haan M (2006) *Brain imaging evidence of preclinical Alzheimer's disease in normal aging*. Annals of Neurology. Vol. 59. No.4, pp.673-681.
- Jeong SK, Cho KH and Kim JM (2004) *The usefulness of the Korean version of modified Mini-Mental State Examination (K-mMMSE) for dementia screening in community dwelling elderly people*. BMC Public Health. Vol. 4, pp.31.
- Jeong SK, Kim JM, Kweon SS, Shin MH, Seo MW and Kim YH (2005) *Does arm length indicate cognitive and functional reserve?* International Journal of Geriatric Psychiatry. Vol. 20, No.5, pp.406-412.
- Johnston SC, O'Meara ES, Manolio TA, Lefkowitz D, O'Leary DH, Goldstein S, et al. (2004) *Cognitive impairment and decline are associated with carotid artery disease in patients without clinically evident cerebrovascular disease*. Annals of Internal Medicine. Vol. 140, No.4, pp.237-247.
- Jones TG, Schinka JA, Vanderploeg RD, Small BJ, Graves AB and Mortimer JA (2002) *3MS normative data for the elderly*. Archives of Clinical Neuropsychology. Vol. 17, pp.171-177.
- Khachaturian AS, Gallo JJ and Breitner JC (2000) *Performance characteristics of a two-stage dementia screen in a population sample*. Journal of Clinical Epidemiology. Vol. 53, No.5, pp.531-540.
- Koster A, Penninx BWJH, Bosma H, Kempen GIJM, Newman AB, Rubin SM, et al. (2005) *Socioeconomic differences in cognitive decline and the role of biomedical factors*. Annals of Epidemiology. Vol. 15, No.8, pp.564-571.
- Kuller LH, Lopez OL, Jagust WJ, Becker JT, DeKosky ST, Lyketsos C, et al. (2005) *Determinants of vascular dementia in the Cardiovascular Health Cognition Study*. Neurology. Vol. 64, No.9. pp.1548-1552.
- Kuller LH, Lopez OL, Newman A, Beauchamp NJ, Burke G, Dulberg C, et al. (2003) *Risk factors for dementia in the cardiovascular health cognition study*. Neuroepidemiology. Vol. 22, No.1, pp.13-22.
- Kuller LH, Shemanski L, Manolio T, Haan M, Fried L, Bryan N, et al. (1998) *Relationship between ApoE, MRI findings, and cognitive function in the Cardiovascular Health Study*. Stroke. Vol. 29, No.2, pp.388-398.
- Kurella M, Chertow GM, Fried LF, Cummings SR, Harris T, Simonsick E, et al. (2005) *Chronic kidney disease and cognitive impairment in the elderly: the health, aging, and body composition study*. Journal of the American Society of Nephrology. Vol. 16, No.7, pp.2127-2133.
- Kurella M, Chertow GM, Luan J and Yaffe K (2004) *Cognitive impairment in chronic kidney disease*. Journal of the American Geriatrics Society. Vol. 52, No.11, pp.1863-1869.
- Kurella M, Luan J, Yaffe K and Chertow GM (2004) *Validation of the Kidney Disease Quality of Life (KDQOL) cognitive function subscale*. Kidney International. Vol. 66, No.6, pp.2361-2367.
- Lamarre CJ and Patten SB (1991) *Evaluation of the Modified Mini-Mental State Examination in a general psychiatric population*. Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie. Vol. 36, No.7, pp.507-511.

Lin MY, Gutierrez PR, Stone KL, Yaffe K, Ensrud KE, Fink HA, et al. (2004) *Vision impairment and combined vision and hearing impairment predict cognitive and functional decline in older women.* Journal of the American Geriatrics Society. Vol. 52, No.12, pp.1996-2002.

Longstreth WT, Jr., Arnold AM, Beauchamp NJ, Jr., Manolio TA, Lefkowitz D, Jungreis C, et al. (2005) *Incidence, manifestations, and predictors of worsening white matter on serial cranial magnetic resonance imaging in the elderly: the Cardiovascular Health Study.* Stroke. Vol. 36, No.1, pp.56-61.

Longstreth WT, Jr., Dulberg C, Manolio TA, Lewis MR, Beauchamp NJ, Jr., O'Leary D, et al. (2002) *Incidence, manifestations, and predictors of brain infarcts defined by serial cranial magnetic resonance imaging in the elderly: the Cardiovascular Health Study.* Stroke. Vol. 33, No.10, pp.2376-2382.

Lopez OL, Jagust WJ, Dulberg C, Becker JT, DeKosky ST, Fitzpatrick A, et al. (2003) *Risk factors for mild cognitive impairment in the Cardiovascular Health Study Cognition Study: part 2.* Archives of Neurology. Vol. 60. No.10, pp.1394-1399.

Louis ED, Levy G, Cote LJ, Mejia H, Fahn S and Marder K (2001) *Clinical correlates of action tremor in Parkinson disease.* Archives of Neurology. Vol. 58, No.10, pp.1630-1634.

Louis ED, Lynch T, Marder K and Fahn S (1996) *Reliability of patient completion of the historical section of the Unified Parkinson's Disease Rating Scale.* Movement Disorders. Vol. 11, No.2, pp.185-192.

MackKnight C, Graham J and Rockwood K (1999) *Factors associated with inconsistent diagnosis of dementia between physicians and neuropsychologists.* Journal of the American Geriatrics Society. Vol. 47, No.11, pp.1294-1299.

Maclean LE, Collins CC and Byrne EJ (2001) *Dementia with Lewy bodies treated with rivastigmine: effects on cognition, neuropsychiatric symptoms, and sleep.* International Psychogeriatrics. Vol. 13, No.3, pp.277-288.

Marder K, Richards M, Bello J, Bell K, Sano M, Miller L, et al. (1995) *Clinical correlates of Alzheimer's disease with and without silent radiographic abnormalities.* Archives of Neurology. Vol. 52, No.2, pp.146-151.

Maxwell CJ, Hicks MS, Hogan DB, Basran J and Eby EM (2005) *Supplemental use of antioxidant vitamins and subsequent risk of cognitive decline and dementia.* Dementia & Geriatric Cognitive Disorders. Vol. 20, No.1, pp.45-51.

Maxwell CJ, Hogan DB and Eby EM (1999) *Calcium-channel blockers and cognitive function in elderly people: results from the Canadian Study of Health and Aging.* CMAJ Canadian Medical Association Journal. Vol. 161, No.4, pp. 501-506.

McDowell I (2006) *Measuring Health: A Guide to Rating Scales and Questionnaires* (3rd ed.) Oxford University Press, Oxford..

McDowell I, Kristjansson B, Hill GB and Hebert R (1997) *Community screening for dementia: the Mini Mental State Exam (MMSE) and Modified Mini-Mental State Exam (3MS) compared.* Journal of Clinical Epidemiology. Vol. 50, No.4, pp.377-383.

Merkli H, Pal E and Horvathne VI (2001) *Clinical characteristics of subcortical arteriosclerotic encephalopathy (Binswanger's disease).* [*Hungarian*]. Orvosi Hetilap. Vol. 142, No.23, pp.1221-1226.

Miller JW, Green R, Ramos MI, Allen LH, Mungas DM, Jagust WJ, et al. (2003) *Homocysteine and cognitive function in the Sacramento Area Latino Study on Aging.* American Journal of Clinical Nutrition. Vol. 78, No.3. pp.441-447.

Mitsis EM (2004) *The construct validity of executive functions in normal adults and in adults with mild cognitive impairment.* Dissertation Abstracts International: Section B: The Sciences and Engineering. Vol 8, No.B,pp.4101.

Murden RA and Galbraith J (1997) *A modified Mini-Mental State Exam for use in the poorly educated.* Clinical Gerontologist. Vol. 17, No.4, pp.23-33.

- Nadler JD, Relkin NR, Cohen MS, Hodder RA, Reingold J and Plum F (1995) *Mental status testing in the elderly nursing home population*. Journal of Geriatric Psychiatry & Neurology. Vol. 8, No.3, pp.177-183.
- Nahin RL, Fitzpatrick AL, Williamson JD, Burke GL, Dekosky ST, Furberg C, et al. (2006) *Use of herbal medicine and other dietary supplements in community-dwelling older people: Baseline data from the ginkgo evaluation of memory study*. Journal of the American Geriatrics Society. Vol. 54, No.11, pp.1725-1735.
- Njegovan V, Hing MM, Mitchell SL, et al. (2001) *The hierarchy of functional loss associated with cognitive decline in older persons*. Journals of Gerontology Series A - Biological Sciences and Medical Sciences. Vol. 56, No.10, pp.M638-M643.
- Norton MC, Tschanz JA, Fan X, Plassman BL, Welsh-Bohmer KA, West N, et al. (1999) *Telephone adaptation of the Modified Mini-Mental State Exam (3MS). The Cache County Study*. Neuropsychiatry, Neuropsychology, & Behavioral Neurology. Vol. 12, No.4, pp.270-276.
- O'Connell ME, Tuokko H, Graves RE and Kadlec H (2004) *Correcting the 3MS for bias does not improve accuracy when screening for cognitive impairment or dementia*. Journal of Clinical and Experimental Neuropsychology. Vol. 26, No.7, pp.970-980..
- Ogunniyi AO, Osuntokun BO, Lekwauwa UB and Falope ZF (1992) *Rarity of dementia (by DSM-III-R) in an urban community in Nigeria*. East African Medical Journal. Vol. 69, No.2, pp.64-68.
- Osterweil D, Mulford P, Syndulko K and Martin M (1994) *Cognitive function in old and very old residents of a residential facility: Relationship to age, education, and dementia*. Journal of the American Geriatrics Society. Vol. 42, No.7, pp.766-773
- Patenaude R and Baillargeon J (1996) *Executive function deficits and the performance of non-demented Parkinsonians on the California Verbal Learning Test (CVLT)*. [French]. Revue de Neuropsychologie. Vol. 6, No.4, pp.443-469.
- Porter RJ, Lunn BS, Walker LL, Gray JM, Ballard CG and O'Brien JT (2000) *Cognitive deficit induced by acute tryptophan depletion in patients with Alzheimer's disease*. American Journal of Psychiatry. Vol. 157, No.4, pp.638-640.
- Porter RJ, Phipps AJ, Gallagher P, Scott A, Stevenson PS and O'Brien JT (2005) *Effects of acute tryptophan depletion on mood and cognitive functioning in older recovered depressed subjects*. American Journal of Geriatric Psychiatry. Vol. 13, No.7, pp.607-615.
- Ramos MI, Allen LH, Mungas DM, Jagust WJ, Haan MN, Green R, et al. (2005) *Low folate status is associated with impaired cognitive function and dementia in the Sacramento Area Latino Study on Aging*. American Journal of Clinical Nutrition. Vol. 82, No.6, pp.1346-1352.
- Rankin MW, Clemons TE and McBee WL (2005) *Correlation analysis of the in-clinic and telephone batteries from the AREDS cognitive function ancillary study*. AREDS Report No. 15. Ophthalmic Epidemiology. Vol. 12, No.4, pp.271-277.
- Rapp SR, Espeland MA, Hogan P, Jones BN, Dugan E, et al. (2003) *Baseline experience with Modified Mini Mental State Exam: The Women's Health Initiative Memory Study (WHIMS)*. Aging & Mental Health. Vol. 7, No.3, pp.217-223.
- Rapp SR, Espeland MA, Shumaker SA, Henderson VW, Brunner RL, Manson JE, et al. (2003) *Effect of estrogen plus progestin on global cognitive function in postmenopausal women: the Women's Health Initiative Memory Study: a randomized controlled trial*. JAMA. Vol. 289, No.20, pp.2663-2672.
- Rockwood K, Tripp DA, Stadnyk K and Fisk J (1994) *Screening for cognitive impairment in the elderly: Impact of physical function measures added to cognitive screening instruments*. Aging & Cognition. Vol. 1, No.4, pp.261-270.
- Rosano C, Simonsick EM, Harris TB, Kritchevsky SB, Brach J, Visser M, et al. (2005) *Association between physical and cognitive function in healthy elderly: the health, aging and body composition study*. Neuroepidemiology. Vol. 24, No.1-2, pp.8-14.

- Rosse RB, Malhotra AK, Kim SY and Deutsch SI (1992) *Visual fixation deficits and evidence of cognitive impairment in schizophrenia*. Biological Psychiatry. Vol. 31, No.4, pp.412-414
- Rosse RB, Schwartz BL, Kim SY and Deutsch SI (1993) *Correlation between antisaccade and Wisconsin Card Sorting Test performance in schizophrenia*. American Journal of Psychiatry. Vol. 150, No.2, pp.333-335.
- Sackeim HA, Luber B, Moeller JR, Prudic J, Devanand DP and Nobler MS (2000) *Electrophysiological correlates of the adverse cognitive effects of electroconvulsive therapy*. Journal of ECT. Vol. 16, No.2, pp.110-120.
- Sambrook R, Herrmann N, Hebert R, McCracken P, Robillard A, Luong D, et al. (2004) *Canadian Outcomes Study in Dementia: study methods and patient characteristics*. Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie. Vol. 49, No.7, pp.417-427.
- Sandholzer H, Breull A and Fischer GC (1999) *A trial of early recognition and management of dementia in general practice. [German]*. Zeitschrift fur Gerontologie und Geriatrie. Vol. 32, No.3, pp.172-178.
- Schulzer M, Calne DB, Snow B and Mak E (1993) *A scoring error in the Mini-Mental State test.[see comment]*. Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie. Vol. 38, No.9, pp.603-605.
- Shadlen MF, Siscovick D, Fitzpatrick AL, Dulberg C, Kuller LH and Jackson S (2006) *Education, cognitive test scores, and black-white differences in dementia risk*. Journal of the American Geriatrics Society. Vol. 54, No.6, pp.898-905.
- Shorr RI, de Rekeneire N, Resnick HE, Yaffe K, Somes GW, Kanaya AM, et al. (2006) *Glycemia and cognitive function in older adults using glucose-lowering drugs*. Journal of Nutrition, Health & Aging. Vol. 10, No.4, pp.297-301.
- Shumaker SA, Legault C, Kuller L, Rapp SR, Thal L, Lane DS, et al. (2004) *Conjugated equine estrogens and incidence of probable dementia and mild cognitive impairment in postmenopausal women: Women's Health Initiative Memory Study.[see comment]*. JAMA. Vol. 291, No.24, pp.2947-2958.
- Shumaker SA, Legault C, Kuller L, Rapp SR, Thal L, Wallace RB, Ockene JK, et al. (2003). *Estrogen plus progestin and the incidence of dementia and mild cognitive impairment in postmenopausal women: the Women's Health Initiative Memory Study: a randomized controlled trial.[see comment]*. JAMA. Vol. 289, No.20. pp.2651-2662.
- Shumaker SA, Reboussin BA, Espeland MA, Rapp SR, McBee WL, Dailey M, et al. (1998) *The Women's Health Initiative Memory Study (WHIMS): a trial of the effect of estrogen therapy in preventing and slowing the progression of dementia*. Controlled Clinical Trials. Vol. 19, No.6, pp.604-621.
- Sobin C, Sackeim HA, Prudic J, Devanand DP, Moody BJ and McElhiney MC (1995) *Predictors of retrograde amnesia following ECT*. American Journal of Psychiatry. Vol. 152, No.7, pp.995-1001.
- St. John P and Montgomery P (2002) *Are cognitively intact seniors with subjective memory loss more likely to develop dementia?* International Journal of Geriatric Psychiatry. Vol. 17, No.9, pp.814-820.
- Steffens DC, Helms MJ, Krishnan KR and Burke GL (1999) *Cerebrovascular disease and depression symptoms in the cardiovascular health study*. Stroke. Vol. 30, No.10, pp.2159-2166.
- Steffens DC, Norton MC, Plassman BL, Tschanz JT, Wyse BW, Welsh-Bohmer KA, et al. (1999) *Enhanced cognitive performance with estrogen use in nondemented community-dwelling older women*. Journal of the American Geriatrics Society. Vol. 47, No.10, pp.1171-1175.
- Stiell IG, Hebert PC, Wells GA, Laupacis A, Vandemheen K, Dreyer JF, et al. (1996) *The Ontario trial of active compression-decompression cardiopulmonary resuscitation for in-hospital and prehospital cardiac arrest*. JAMA. Vol 275, No.18, pp.1417-1423.
- Suhr JA and Grace J (1999) *Brief cognitive screening of right hemisphere stroke: relation to functional outcome*. Archives of Physical Medicine & Rehabilitation. Vol. 80, No.7m pp.773-776.

Tabert MH, Albert SM, Borukhova-Milov L, et al. (2002) *Functional deficits in patients with mild cognitive impairment: Prediction of AD*. Neurology. Vol. 58, pp.758-764.

Tariska P and Paksy A (2000) *Cognitive enhancement effect of piracetam in patients with mild cognitive impairment and dementia. [Hungarian]*. Orvosi Hetilap. Vol. 141, No.22, pp.1189-1193.

Teng EL and Chui HC (1987) *The Modified Mini-Mental State (3MS) Examination*. Journal of Clinical Psychiatry. Vol. 48, pp.314-318.

Teng EL, Chui HC and Gong A (1990) *Comparisons between Mini-Mental State Examination (MMSE) and its modified version - the 3MS test* In: Psychogeriatrics: Biomedical and Social Advances. Excerpta Medica, Amsterdam, pp.189-192.

Tombaugh TN (2005) *Test-retest reliable coefficients and 5-year change scores for the MMSE and 3MS*. Archives of Clinical Neuropsychology. Vol. 20, No.4, pp. 485-503.

Tombaugh TN, McDowell I, Kristjansson B and Hubley AM (1996) *Mini-Mental State Examination (MMSE) and the Modified MMSE (3MS): A psychometric comparison and normative data*. Psychological Assessment. Vol. 8, No.1, pp.48-59.

Tschanz JT, Welsh-Bohmer KA, Plassman BL, Norton MC, Wyse BW, Breitner JCS, et al. (2002) *An adaptation of the modified mini-mental state examination: analysis of demographic influences and normative data: the cache county study*. Neuropsychiatry, Neuropsychology, and Behavioral Neurology. Vol. 15, No.1, pp.28-38.

Viscogliosi C, Desrosiers J, Gauthier P and Beauchemin R (2000) *Effect of a multi-strategic group program on performance of the activities of daily living for elderly people with mild cognitive deficits. [French]*. Canadian Journal of Occupational Therapy - Revue Canadienne d Ergotherapie. Vol. 67, No.5, pp.314-323.

Whitmer RA, Haan MN, Miller JW and Yaffe K (2003) *Hormone replacement therapy and cognitive performance: the role of homocysteine*. Journals of Gerontology Series A-Biological Sciences & Medical Science. Vol. 58, No.4, pp.324-330.

Worrall G, Moulton N and Briffett E (1993) *Effect of type II diabetes mellitus on cognitive function*. Journal of Family Practice. Vol. 36, No.6, pp.639-643.

Worrall GJ, Chaulk PC and Moulton N (1996) *Cognitive function and glycosylated hemoglobin in older patients with type II diabetes*. Journal of Diabetes & its Complications. Vol. 10, No.6, pp.320-324.

Wu JH, Haan MN, Liang J, Ghosh D, Gonzalez HM and Herman WH (2003) *Impact of antidiabetic medications on physical and cognitive functioning of older Mexican Americans with diabetes mellitus: a population-based cohort study*. Annals of Epidemiology. Vol. 13, No.5, pp.369-376.

Wu, JH, Haan MN, Liang J, Ghosh D, Gonzalez HM and Herman WH (2003) *Impact of diabetes on cognitive function among older Latinos: a population-based cohort study*. Journal of Clinical Epidemiology. Vol. 56, No.7, pp.686-693.

Yaffe K, Haan M, Byers A, Tangen C and Kuller L (2000) *Estrogen use, APOE, and cognitive decline: evidence of gene-environment interaction*. Neurology. Vol. 54, No.10, pp.1949-1954.

Yavuz N, Karata M and Kilinc S (2000) *Correlates for end-stage renal disease patients*. Scandinavian Journal of Caring Sciences. Vol. 14, No.3, pp.179-183.

KICA Assessment Battery

Title:	Kimberley Indigenous Cognitive Assessment
Abbreviations:	KICA (subsections KICA-Cog, KICA-Carer and KICA-ADL reviewed)
Author(s) Name:	Dina LoGiudice, Kate Smith, Osvaldo Almeida, Nicola Lautenschlager, Jenny Thomas, Anna Dwyer, Leon Flicker
Author(s) Address:	Dr Dina LoGiudice National Ageing Research Institute PO Box 31 Poplar Rd Parkville VIC 3052 Australia
Supplied by:	WA Centre for Health and Ageing, University of Western Australia
Cost:	No cost - download from www.wacha.org.au
Training requirements:	No formal training required, however a training DVD is available at no cost through kate.smith@uwa.edu.au
Purpose:	To assist in the detection of dementia in Aboriginal and Torres Strait Islander peoples.
Administration time:	KICA-Cog - 30mins, KICA Carer- 5 mins, KICA-ADL- 3 mins.
Instrument Type:	Screening tool, interviewer administered. Recommend use of interpreters when required.
Structure:	KICA comprised of medical history, cognitive assessment (KICA-Cog), depression scale, carer report of medical history, carer cognitive report (KICA-Carer), family depression scale, and activities of daily living (KICA-ADL).
Scoring:	KICA-Cog has 16 items and a score of 33 or less out of 39 indicates possible dementia. KICA-Carer has 8 items and a score of 3 or above out of 16 indicates possible dementia. KICA-ADL has 10 items, but no score is generated. sKICA has 10 items and a score of 21 or less out of 25 indicates possible dementia.
Developed for:	Health workers to screen for dementia in Aboriginal and Torres Strait Islander Australians who are aged over 45 years and living in remote Australia.
Normative Data:	The KICA has been used in a dementia prevalence study (Smith et al., 2008; Smith et al., 2009) in the Kimberley region of Western Australia (N=363).
Clinical/ Reference Data:	The KICA has been used in validity studies in the Kimberley region (LoGiudice et al 2006), Northern Territory (Marsh et al., 2006; Smith et al., 2009) and Far North Queensland (Stevenson et al., 2008).
Applications:	For health and community care workers to screen for cognitive impairment in Aboriginal and Torres Strait Islander peoples aged over 45 years living in remote Australia.
Carer and/or Patient Use of Instrument:	Patient and carer sections

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	<p>LoGiudice et al. (2006)</p> <p>Smith et al. (2009)</p> <p>Marsh et al. (2006)</p> <p>Smith (2008)</p>	<p>x Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>KICA-Cog alpha 0.87 n=70 in original study.</p> <p>KICA-Cog alpha 0.91 in Kimberley revalidation study (n=363).</p> <p>KICA-Cog alpha 0.81 in Northern Territory study (n=52).</p> <p>KICA-Carer alpha 0.85 (n=350).</p> <p>KICA-ADL alpha 0.93.</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	<p>LoGiudice et al. (2006)</p> <p>Smith (2008)</p>	<p>x ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p>x Marginal or inadequate test-retest reliability</p> <p>ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>KICA Cog ICC/Kappa ranged between 0.7 and 1.0 for 12 out of 16 questions.</p> <p>Name animals ICC 0.5, significance 0.75 and cued recall pictures 0.2, significance 0.4.</p> <p>Two questions could not be calculated due to empty cells but response was identical for 13/14 subjects (year) and 11/14 subjects (sky ground question).</p> <p>KICA-Carer - out of 13 questions 6 scored above 0.7; 3 were unable to be calculated due to empty calls (response identical for 14/14 subjects for 2 questions and 13/14 subjects for the other).4 questions had scores ranging from 0.07 – 0.59.</p>

<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	<p>Smith (2008)</p>	<p>x Agreement reported and adequate</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inadequate inter-rater agreement <input type="checkbox"/> No information provided <input type="checkbox"/> Not applicable 	<p>KICA-Cog: Bland Altman method no significant differences between raters - mean difference 0, SD 1.79, range±3, coefficient of repeatability 3.59, limits of agreement ±3.59.</p> <p>KICA-Carer: Bland Altman method, only 1 out of 14 subjects had a total score that differed significantly between the two raters. Coefficient of repeatability 3.54, limits of agreement - 3.47-3.61, range +/-3.4.</p>
--	---------------------	--	---

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>	<p>LoGiudice et al. (2006)</p> <p>Smith et al. (2007)</p> <p>Marsh et al. (2006)</p> <p>Smith (2008)</p>	<p>x Patients/target groups and experts were involved during item selection and/or item reduction</p> <ul style="list-style-type: none"> <input type="checkbox"/> Patients/target groups were consulted for reading and comprehension <input type="checkbox"/> No patient/target group involvement <input type="checkbox"/> No information found on content validity <input type="checkbox"/> There is an adequate coverage of relevant domains <input type="checkbox"/> There is limited coverage of relevant domains 	<p>Indigenous councils, community members, health services, clinicians, interpreters and linguists were involved in item selection. Other cognitive instruments were reviewed.</p> <p>The draft questions were trialled with 15 Aboriginal community members with varying degrees of cognitive impairment and items excluded as required.</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>Stevenson et al (2008)</p>	<p>x Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <ul style="list-style-type: none"> <input type="checkbox"/> Limited construct validity information reported <input type="checkbox"/> Inadequate or no information on construct validity reported 	<p>sKICA-Cog and MMSE were positively correlated Spearman's rho 0.76, r^2 0.66. KICA-Cog well accepted (unlike MMSE) by health workers and Aboriginal community members.</p>
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	<p>LoGiudice et al. (2006)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> No evidence provided/failed a test of dimensionality <input type="checkbox"/> Some evidence 	<p>KICA-Cog 3 items on pension week, recall and free recall had discriminant factor coefficients of 0.34,</p>

	<p>Smith et al. (2009)</p> <p>Smith (2008)</p>	<p>provided to support internal structure</p> <p>xSubstantial evidence provided to support internal structure</p>	<p>0.51 and 0.71 respectively; correctly classify 85.7% of participants as dementia or no cognitive impairment.</p> <p>KICA-Cog 5 items pension week, registration, recall, copying alternating designs and free recall correctly classify 96.7% of participants as dementia or no cognitive impairment.</p> <p>KICA-Carer and sKICA-Cog correlation r^2 0.48.</p>
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Stevenson et al. (2008)</p>	<p>x Correlations with other measures are reported</p> <p><input type="checkbox"/> Correlations not reported</p>	<p>sKICA-Cog and MMSE were positively correlated Spearman's rho 0.76, r^2 0.66. KICA-Cog well accepted (unlike MMSE) by health workers and Aboriginal community members.</p>
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Smith et al. (2009)</p> <p>LoGiudice et al. (2006)</p> <p>Smith et al. (2009)</p> <p>Smith (2008)</p>	<p>x Scale differentiates between relevant categories of respondents</p> <p><input type="checkbox"/> No information provided on discriminant validity</p>	<p>KICA-Cog validity sensitivity of 93% and specificity of 95% at a cut off score of 33/34 out of 39. A score of 33 and below indicates possible dementia. Area under ROC 0.984 (N=363).</p> <p>KICA-Cog validity sensitivity of 91% and specificity of 93% at a cut off score of 31/32 out of 39. Area under ROC 0.95. N=70.</p> <p>KICA-Cog validity sensitivity of 82%, specificity of 88% at a cut off score of 31/32 out of 39. Area under ROC 0.95. N=52.</p> <p>KICA-Carer validity sensitivity of 76%, specificity 84% at a cut off score of 2/3 out of 16. Area under ROC 0.909.</p>
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>	<p>LoGiudice et al. (2006)</p> <p>Smith et al. (2009)</p> <p>Smith (2008)</p>	<p>x Comparison made to criterion measures</p> <p><input type="checkbox"/> Limited comparison with criterion measures provided</p> <p><input type="checkbox"/> No comparison with criterion measures provided</p>	<p>Comparison of scores made to gold standard. Geriatrician review blinded to KICA scores, followed by consensus diagnosis of two specialists using DSM-IV and ICD-10 criteria also blinded to KICA scores.</p> <p>Information on the number and range of DSMIV and ICD diagnoses are presented. The DSMIV diagnosis and corresponding range of</p>

			KICA-Cog scores within each diagnosis are detailed.
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>	<p>Smith (2008)</p> <p>LoGiudice et al. (2006)</p> <p>Smith (2008)</p>	<p>x Authors provide 2 or more types of information on interpretability</p> <p><input type="checkbox"/> Authors provide limited information to assist with interpretability</p> <p><input type="checkbox"/> No information provided</p>	<p>The frequencies, percentiles, mean and SD of the total KICA-Cog scores is given.</p> <p>Provide information on demographic and cognitive differences and KICA-Cog scores for each group.</p> <p>Information on the number and range of DSMIV and ICD diagnoses are presented. The DSMIV diagnosis and corresponding range of KICA-Cog scores within each diagnosis are detailed.</p> <p>KICA-ADL answers and corresponding level of dementia (mild, moderate, severe) are outlined.</p>

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>	<p>Smith (2008)</p>	<p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects were detected</p> <p>x Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score</p> <p><input type="checkbox"/> No or limited information provided on floor and ceiling effects</p>	<p>Distribution of KICA-Cog scores shown, 17% achieved highest possible score of 39, 41% achieved 38-39.</p>
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>		<p><input type="checkbox"/> Hypotheses were formulated and results were in agreement</p> <p><input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard)</p> <p>xNo information on sensitivity to change was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the</p>	<p>A study is currently underway in the Kimberley region to acquire longitudinal data.</p>

		magnitude of score differences which would be clinically meaningful <input type="checkbox"/> MCID – No information was provided.	
--	--	---	--

Cultural Applicability and Cultural Adaptations:

The KICA-Cog, KICA-Carer and KICA-ADL were translated into Walmajarri language and back-translated to English successfully. It is approved by Kimberley Language Resource Centre for use with Aboriginal interpreters. These components are appropriate rural/remote Aboriginal and Torres Strait Islander Australians, if unsure of appropriateness in particular rural areas assessors should ask a cultural consultant. It is valid in Kimberley region of Western Australia, Northern Territory and Far North Queensland including the Torres Strait.

Gender Appropriateness:

Appropriate for use with both genders. Recommend interpreters of the same sex as patients are employed to ensure cultural acceptability.

Age Appropriateness:

Appropriate for use in people aged over 45 years. If used with people aged under 45 years do not use cut off scores.

Summary:

The KICA-Cog is a cognitive screening tool for dementia in Aboriginal and Torres Strait Islander peoples living in rural/remote regions aged over 45 years. It is the patient cognitive subsection of the Kimberley Indigenous Cognitive Assessment (KICA). It was developed in the Kimberley region of Western Australia in liaison with a large number of health, cultural and community organisations, and validated in the Kimberley, the Northern Territory and Far North Queensland including the Torres Strait. It can be downloaded from www.wacha.org.au. A KICA-Cog training DVD is available at no cost. It is recommended that the other KICA components are conducted in addition to the KICA-Cog for further information on cognitive status and possible co-morbid conditions and differential diagnoses. A score of 33 or below out of 39 indicated that a referral is required to a doctor to review for dementia. The sKICA (KICA-Screen) can be used when time is limited. It is recommended that the KICA-Carer is also used.

The KICA-Carer is an informant questionnaire given by the interviewer. It is the informant cognitive subsection of the Kimberley Indigenous Cognitive Assessment (KICA) that was developed and validated in the Kimberley region of Western Australia. A score of 3 or above out of 16 indicates that a referral is required to a doctor to review for dementia. It is recommended that the other KICA components are conducted in addition to the KICA-Carer for further information on cognitive status and possible co-morbid conditions and differential diagnoses.

The KICA-ADL is the daily living skills (ADL and IADL) section of the KICA. It is an informant questionnaire given by the interviewer. It has not been validated; however it shows excellent internal consistency and can be used to assist the doctor in determining the diagnosis and level of dementia, and health and community workers in determining the level of support services required. It is recommended that the other KICA components are conducted in addition to the KICA-ADL for information on cognitive status and possible co-morbid conditions and differential diagnoses.

Reporter:

Kate Smith, Leon Flicker

Date of report:

16.04.2010

References

LoGiudice D, Smith K, Thomas J, Lautenschlager NT, Almeida OP, Atkinson D and Flicker L (2006) *Kimberley Indigenous Cognitive Assessment tool (KICA): Development of a cognitive assessment tool for older Indigenous Australians*. International Psychogeriatrics. Vol. 18, pp. 269-280.

Marsh G, Inglis M, Smith K & LoGiudice D (2006) *Validation of the Kimberley Indigenous Cognitive Assessment tool (KICA) in rural and remote Indigenous communities of the Northern Territory*. A joint collaboration between Alzheimer's Australia NT, University of Western Australia and National Ageing Research Institute, Alzheimer's Australia, Canberra. Available from <http://www.alzheimers.org.au/content.cfm?categoryid=28>

Smith K, Flicker L, Lautenschlager NT, Almeida OP, Atkinson D, Dwyer A and LoGiudice D (2008) *High prevalence of dementia and cognitive impairment in Indigenous Australians*. Neurology. Vol. 71, pp. 1470-1473.

Smith K, Flicker L, Dwyer A, Marsh G, Mahajani S, Almeida O.P, Lautenschlager, N.T, Atkinson D and LoGiudice D (2009) *Assessing cognitive impairment in Indigenous Australians – Re-evaluation of the Kimberley Indigenous Cognitive Assessment (KICA) in Western Australia and the Northern Territory*. Australian Psychologist. Vol. 44, pp. 54-61.

Smith K, LoGiudice D, Dwyer A, Thomas J, Flicker L, Lautenschlager NT, Almeida OP, and Atkinson D (2007) *'Ngana minyarti? What is this?' Development of cognitive questions for the Kimberley Indigenous Cognitive Assessment*. Australasian Journal on Ageing. Vol. 26, pp. 115-119.

Smith K (2008) *Assessment and prevalence of dementia in Indigenous Australians (thesis)*. University of Western Australia. Available from <http://catalogue.library.uwa.edu.au/>

Stevenson M, Smith K, Strivens E (2008) *Indigenous Cognitive Assessment-Validation of the sKICA-Cog in Far North Queensland*. Queensland Health, Brisbane.

IQCODE

Title:	IQCODE - Informant Questionnaire for Cognitive Decline in the Elderly
Abbreviations:	IQCODE
Author(s) Name:	Professor Anthony F. Jorm
Author(s) Address:	213-217 Grattan St. University of Melbourne Parkville Campus Melbourne VIC ORYGEN Research Centre ajorm@unimelb.edu.au
Supplied by:	Australian National University Ageing Research Unit. The instrument is available at http://cmhr.anu.edu.au/ageing/Iqcode/
Cost:	Nil
Training requirements:	The informant / proxy rater needs to have known the patient for 10 years
Purpose:	<p>The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) (Jorm, 2004) is an Australian developed and widely used, informant based measure to screen for dementia. The short (and recommended version) of the questionnaire includes 16 items examining everyday cognitive abilities (e.g. remembering own telephone number and learning new things), with a few functional items (e.g. handling money for shopping) (Sansoni et al., 2008).</p> <p>It looks at changes in “the everyday cognitive function of an elderly person and aims to assess cognitive decline independently of pre-morbid ability” (Burns et al., 2004, page 348).</p>
Administration time:	10 - 15 minutes (Burns et al., 2004).
Instrument Type:	Informant / Proxy Rating Scale (Interview or self administered) (McDowell, 2006).
Structure:	<p>The IQCODE looks at the following domains: episodic memory, semantic memory, procedural memory, working memory, language comprehension, language production and executive function (Langley, 2004).</p> <p>The informant or proxy rater responds to the 16 statements on a 5 point likert scale in terms of a change in functioning. The scale categories are: 1 = Much improved; 2 = A bit improved; 3 = Not much change; 4 = A bit worse; 5 = Much worse.</p> <p>The paper by Jorm (2004) recommends the use of the 16 item version for English speakers.</p>
Scoring:	<p>Scores range from 16 to 80 points on the 16 item version (26 to 130 points on the 26 item version). Higher scores indicate greater impairment (Langley, 2004).</p> <p>Each item is rated on a 1-5 scale where 1 =considerable improvement through to 5= considerable deterioration. An overall average score is created by averaging the scores on each item. In this way the overall score can be interpreted in the same way as the individual items. . Scores below 3.00 indicate improvement, 3.00 indicates no change, 3.01 – 3.50 indicates slight decline; 3.51- 4.00 indicates moderate decline; and 4.01 – 5.00 indicate severe decline.</p>

McDowell (2006) reports up to a quarter of items can be missing before the overall score is regarded as missing. However, Jorm (2004) recommends only 3 or 2 missing items - depending on whether you are using the long or short version of the scale.

Developed for:

The IQCODE can be used as a part of a clinical assessment of cognition or as a screen for dementia (McDowell, 2006). It looks at cognition and functioning in daily life – which are key constructs in the diagnosis of dementia (McDowell, 2006).

The 26 item version correlates very strongly with the 16 item version (0.98). (The shorter version correlates -0.58 with the MMSE, compared to -0.61 for the longer version (Jorm, 1994 as cited in Langley, 2004; Burns et al., 2004; McDowell, 2006; Jorm, 2004).

Normative Data:

Population norms (n=613) are available in the original paper by Jorm and Jacomb (1989) as cited by McDowell (2006) and Jorm (2004).

Clinical/Reference Data:

A number of clinical studies were found in related clinical areas.

Disease groups:

- Delirium (symptoms): Schuurmans et al. (2003); McCusker et al. (2004)
- Delirium (post-surgery): Wacker et al. (2006); Priner et al. (2008)
- Diabetes: Bruce et al. (2001)
- ICU treatment (with older patients one year post): de Rooij et al. 2008
- Head trauma patients (examining pre-morbid status): Jackson et al. (2007)
- Heart disease (use of warfarin medication): Barber et al. (2004)
- Neuro-imaging: Viswanathan et al. (2008); Farias et al. (2004); Mok et al. (2004, 2005)
- Stroke: Serrano et al. (2007); Cordonnier et al. (2007) (Epileptic seizures after stroke); Klimkowicz et al. (2004)

Applications:

Average scores of 3.6 or higher are indicative of a case (dementia). Other studies have used lower thresholds 3.27/3.30 (or 3.31/3.38 for the 16 item version) (as cited in McDowell, 2006). The paper by Jorm (2004) sets the figure of 3.44+.

Scores higher than 3.3 predict the development of dementia. Higher scores are also predictive of mortality (as interpreted by McDowell, 2006). However, Jorm (2004) comments in relation to predicting mortality that the evidence from a number of different samples (stroke, medical inpatients) is mixed.

A detailed analysis of the IQCODE cut scores used in various studies is provided by Jorm (2004). He suggests comparing this data with the sample you intend to screen.

Some authors like Diesfeldt (2008) suggest that the IQCODE overestimates cognitive impairment in older patients when compared to a detailed cognitive test (looking at multiple areas of cognitive functioning for example memory, verbal fluency, orientation, clock drawing, copying).

Cherbuin et al. (2006) after reviewing the literature did recommend placement of the IQCODE on the National Dementia Website (Sansoni et al. 2008).

The IQCODE was found to be used in a number of recent population surveys, especially in Brazil (Lopes et al., 2007; Hototian et al., 2008). It has also been used in the Second Longitudinal Study of Aging (LSOA II) in the United States (see Pratt et al., 2008); and a study examining the relationship between present day cognitive functioning of a group of older persons (mean age = 75 years) (n=396) with their adolescent IQ scores from the mid 1940s (see Fritsch et al., 2005).

Carer and/or**Patient Use of Instrument:**

The Canberra Interview for the Elderly (CIE) Informant Interview (Henderson et al., 1992) is related to the IQCODE (Sansoni et al., 2008).

A retrospective / post-mortem version is also available (Burns et al., 2004, see Jorm 2004 for further details). It has reasonable sensitivity (73%) and specificity (75%) for a dementia diagnosis when compared with neuropathological findings (Thomas et al., 1994, as cited in McDowell, 2006). Jansen et al. (2008) have produced and studied a self-report version of the IQCODE.

It should be noted that the IQCODE is a proxy / informant measure. While this measurement approach provides an independent assessment of a person's current and pre-morbid cognitive ability it is potentially subject to a number of biases related to the use of an informant and the context and relationship between the informant and the patient. For example, the informant's mood or personality may affect their answers likewise the testing situation may illicit different answers depending on the purpose (for instance nursing home placement). Different types of informants (e.g. nurses and family members) have different perspectives and they may give different answers about the behaviour of an individual patient. For further details about the advantages and disadvantages of proxy measurement in dementia see Sansoni et al. 2008. In summary, as a proxy measure the IQCODE is not immune from these issues.

The IQCODE is not influenced by education level, pre-morbid intelligence or occupational status Langley (2004) and McDowell (2006). While not affected by education and pre-morbid ability, results on the IQCODE maybe affected by the affect and personality of the patient and the affect of the informant as well as the quality of their relationship (as commented on by Langley, 2004 and McDowell, 2006). This has been found to influence ratings when either the patient or informant is depressed (see McDowell, 2006).

Some authors recommend using the IQCODE and MMSE in combination to better identify dementia patients. However the results from several studies show mixed results (McDowell, 2006). A closer examination finds that there is some debate in the recent literature as to whether the IQCODE performs better as a screening or diagnostic instrument when it is combined with a cognitive test (like the 3MS for example). While the target group, study methods and cognitive instruments varied, papers by Srikanth et al. (2006), Bottino et al. (2009), Hancock and Larner (2009), Isella (2006), Mackinnon et al. (2003), and Narasimhalu et al. (2008) did find improvements in screening ability by adding a cognitive test to the IQCODE. However, a number of other papers found no benefit (de Abreu et al., 2008; Knafelc et al., 2003; Arnold et al., 2009). Jorm (2004) recommends the use of the IQCODE together with a cognitive test or in sequence if one finds problems. However, Jorm (2004) also recommended further research in the screening area using a range of information from different sources.

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	<p>McDowell (2006)</p> <p>Sansoni et al. (2008)</p> <p>Tang et al. (2004)</p> <p>Jorm (2004)</p>	<p>X Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>Cronbach's alpha = 0.93 (Dementia patients); 0.95 (general population) (as cited by McDowell, 2006 and Sansoni et al., 2008).</p> <p>Jorm (2004) summarises the data from a number of studies producing an alpha range of between 0.93-0.97.</p> <p>Using IRT in a sample of Chinese stroke patients, Tang et al. (2004) found some item redundancy.</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	<p>Langley 2004</p> <p>McDowell (2006)</p> <p>Sansoni et al. (2008)</p>	<p>X ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>Test-retest reliability = 0.96 [timeframe = 3 days] and 0.75 (timeframe = 12 months, n = 260) (as cited in Langley 2004, McDowell 2006 and Sansoni et al., 2008).</p> <p>Reliability of the IQCODE in a sample of intellectually disabled older adults was poor (Schultz et al., 1998 as cited by Jorm, 2004).</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>		<p><input type="checkbox"/> Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p>X No information provided</p> <p><input type="checkbox"/> Not applicable</p>	<p>Information not found on this aspect of the instrument.</p>

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>		<ul style="list-style-type: none"> <input type="checkbox"/> Patients/target groups and experts were involved during item selection and/or item reduction <input type="checkbox"/> Patients/target groups were consulted for reading and comprehension <input checked="" type="checkbox"/> No patient/target group involvement <input type="checkbox"/> No information found on content validity <input type="checkbox"/> There is an adequate coverage of relevant domains <input type="checkbox"/> There is limited coverage of relevant domains 	<p>Not applicable as the instrument was developed by the authors as an interview and then a questionnaire. It was then tested on clinical and population samples (see Jorm and Jacomb, 1989).</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>Sansoni et al. (2008)</p> <p>McDowell (2006)</p> <p>Jorm (2004)</p>	<p><input checked="" type="checkbox"/> Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <ul style="list-style-type: none"> <input type="checkbox"/> Limited construct validity information reported <input type="checkbox"/> Inadequate or no information on construct validity reported 	<p>Sansoni et al. (2008) states that the IQCODE "has well developed validity data, including comparison studies with clinical diagnosis, neuropathology, neuro-imaging and other cognitive and informant tests". These are discussed in detail by McDowell (2006) and Jorm (2004).</p>
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	<p>McDowell (2006)</p> <p>Jorm (2004)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> No evidence provided/failed a test of dimensionality <input type="checkbox"/> Some evidence provided to support internal structure <input checked="" type="checkbox"/> Substantial evidence provided to support internal structure 	<p>While the instrument was designed to cover several aspects of cognition it seems to be measuring a single general factor (McDowell, 2006).</p> <p>Evidence for this can be seen above with the reported high item total correlations and in terms of the original factor analysis. Factor loadings from 0.47 to 0.81 for each item were found on the first derived factor (Jorm et al., 1989, as cited by McDowell, 2006). The first factor accounted for 42% of the variance followed by 10% and 7% for the other factors.</p> <p>Jorm (2004) summarises a number of studies and also reports a large</p>

			general factor accounting for 42% to 61% of the variance.
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Sansoni et al. (2008)</p> <p>McDowell (2006)</p> <p>Langley (2004)</p> <p>Isella et al. (2006)</p> <p>Hancock and Lerner (2009)</p> <p>Jorm (2004)</p>	<p>X Correlations with other measures are reported <input type="checkbox"/> Correlations not reported</p>	<p>Correlates well with the MMSE in the range of -0.37 to -0.78 (Sansoni et al. 2008 and Jorm, 2004).</p> <p>Studies have correlated the IQCODE with other short cognitive instruments including the AMTS, SPMSQ and the Clifton information / orientation sub-scale (see McDowell, 2006).</p> <p>Correlates with the WMS-R and WAIS-R as well as the Ravens, Boston Naming Test, Benton Visual retention test, Rey Auditory Verbal Learning Test (as cited in Langley, 2004, Jorm, 2004 and McDowell, 2006).</p> <p>In study of stroke patients the IQCODE correlated -0.60 with the Barthel Index (Starr et al., 2000, as cited by McDowell, 2006).</p> <p>The IQCODE has been used with Addenbrooke's Cognitive Examination-Revised (see Hancock and Lerner, 2009).</p> <p>Isella et al. (2006) compared the IQCODE to another neuropsychological instrument - Rey's Auditory Verbal Learning Test (RAVLT) with an Italian sample.</p> <p>While Mok et al. (2004) compared the IQCODE with the Clinical Dementia Rating Scale for a group of stroke patients with small vessel disease.</p> <p>Jorm (2004) reports on high correlation of the IQCODE with other proxy measures (like the Blessed, Psycho-geriatric Assessment Scales); and higher correlations between the IQCODE and IADL scales over ADL scales - as they are more cognitively demanding.</p>

<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>McDowell (2006)</p>	<p>X Scale differentiates between relevant categories of respondents</p> <p><input type="checkbox"/> No information provided on discriminant validity</p>	<p>A correlation of 0.44 was found between the IQCODE and the level of care received by a patient (Jorm et al., 1989 as cited by McDowell, 2006).</p> <p>One year after testing, those who were admitted to a nursing home had lower scores on the IQCODE than those that remained in the community (Jorm and Jacomb, 1989 as cited by McDowell, 2006).</p>
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>	<p>Langley (2004)</p> <p>Burns et al. (2004)</p> <p>McDowell (2006)</p> <p>Jorm (2004)</p>	<p>X Comparison made to criterion measures</p> <p><input type="checkbox"/> Limited comparison with criterion measures provided</p> <p><input type="checkbox"/> No comparison with criterion measures provided</p>	<p>A good screener for dementia comparable to the MMSE (Jorm et al., 1991, 1996, as cited by Langley, 2004, Burns et al., 2004, McDowell, 2006).</p> <p>McDowell (2006) reports on this information in-depth. A cut point of 4+ was used by Jorm and Jacomb (1989) with 92.7% sensitivity and 88% specificity in terms of a clinical diagnosis of dementia. The IQCODE has also been shown to be comparable to other diagnostic approaches, including DSM-III-R and ICD-10 and using MMSE scores.</p> <p>Jorm (2004) also demonstrates better performance of the IQCODE over the MMSE when compared to clinical diagnosis.</p> <p>Pasquini et al. (2007) reports that change in IQCODE scores is an independent predictor of institutionalisation 3 years after a stroke.</p>
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the</p>	<p>McDowell (2006)</p> <p>Cherbuin et al. (2008)</p> <p>Jorm (2004)</p>	<p>X Authors provide 2 or more types of information on interpretability</p> <p><input type="checkbox"/> Authors provide limited information to assist with interpretability</p> <p><input type="checkbox"/> No information provided</p>	<p>Jorm (1997) as cited by McDowell (2006) has reported on the effect size of the IQCODE. A mean effect size of 1.82 was found, though with some variability between studies.</p> <p>Jorm (2004) report this mean effect size to be 1.75.</p> <p>Cherbuin et al. (2008) in</p>

<p>distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>		<p>their review of the literature recommended the use of the IQCODE for screening for dementia and potential for use online.</p> <p>Jorm (2004) reports on 19 studies showing little association between IQCODE scores and education level, pre-morbid ability or language proficiency.</p> <p>Jorm (2004) reviewing the evidence, showed that IQCODE scores can be influenced by the mental health / psychological distress / carer burden of proxy informants.</p>
--	--	--

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>		<p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects were detected</p> <p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score</p> <p>X No or limited information provided on floor and ceiling effects</p>	<p>Information not found on this aspect of the instrument.</p>
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>	<p>Langley (2004)</p> <p>Butt and Butt (2008)</p>	<p>X Hypotheses were formulated and results were in agreement</p> <p><input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard)</p> <p><input type="checkbox"/> No information on sensitivity to change was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful</p> <p><input type="checkbox"/> MCID – No information was provided.</p>	<p>Good results cited in Langley (2004).</p> <p>Butt and Butt (2008) used IRT to examine the sensitivity of the IQCODE and found that its items are adequate for use as a screening instrument.</p>

**Cultural Applicability
and Cultural Adaptations:**

Burns et al. (2004) reports that the IQCODE has been translated into the French language (Mulligan et al., 1996, as cited in Burns et al., 2004). McDowell (2006) also reports that the IQCODE has been translated into Italian, Spanish, French-Canadian, Dutch, Chinese and Thai. The instrument has also been used in Singapore (Lim et al., 2003), Germany (Ehrensperger et al., 2010) and Brazil (Hototian et al., 2008; Lopes et al., 2007; Perrocco et al., 2009).

Potter et al. (2009) in a study of African Americans and whites reports that proxy reports like the IQCODE can be influenced by cultural differences and called for more comparative research in this area. Tokuhara et al. (2006) has looked at the screening ability of the instrument for Japanese Americans. The IQCODE has also been used in a group of 200 elderly Arab Americans (Wrobel and Farrag, 2008) and in a neuro-imaging study of Spanish speaking Hispanic Americans (Farias et al., 2004).

Gender Appropriateness:

Appropriate for use with both genders. Though there is a “a slight tendency for female respondents to show greater declines (Jorm and Jacomb, 1989)” (McDowell, 2006, page 453).

Age Appropriateness:

Adults. *NB: “Several studies have found moderate correlation between IQCODE scores and age (a range of 0.30 to 0.35 is typical)” (Jorm and Jacomb, 1989) (McDowell, 2006, page 453). This suggests that the IQCODE is subject to age effects. Updated norms need to further examine this issue.*

Summary:

The IQCODE the leading proxy / informant measure for dementia screening and assessment (McDowell, 2006; Sansoni et al., 2008). It is a well validated measure (including studies using neuropsychological measures and neuro-imaging). It provides accurate information which compliments cognitive testing and is relevant to the diagnosis of dementia. It is also a good screening instrument with comparable results to other methods including the MMSE. The instrument is unaffected by education, language and premorbid ability (Jorm, 2004) and “also appears to have overcome the common bias in such tests toward people with higher education.” (McDowell, 2006, page 454).

The IQCOCE also has good utility as a screen tool for clinical research purposes – it is especially useful as a telephone screen (Langley, 2004) (for an application see the paper by Arnold et al. 2009 or Fritsch et al. 2005).

The main practical criticism of the IQCODE is the potential that a patient lacks a suitable informant that has known them for 10 years. Langley (2004) criticises the 10 year time frame on the following grounds: 1) not all carers know the patient for more than 10 years; 2) 10 years is a long period for the informant to recall accurately; 3) over a 10 year recall period ageing effects may be misattributed to dementia. Langley (2004) suggests that a time frame of 5 years may be more appropriate. (Jorm [2004] reviews three studies with different time-frames but they give no evidence in regard to the validity of this approach.)

Some issues require further investigation. These include:

- Examination of why only one main factor emerges in the IQCODE even though different aspects of cognition (e.g. working memory, language, executive functioning) are assessed (see McDowell, 2006; Jorm, 2004). (*COMMENT: This may be due to the response categories of the IQCODE which relate to the individual’s previous performance rather than reflect a rating of the specific construct eg.*

working memory.)

- The impact of changes in physical functioning on IQCODE scores (see McDowell, 2006).
- The need to examine the validity of IQCODE scores in relation to different types of informant (age, living with carer, frequency of contact) and the purpose of assessment (for example: research versus access to services) (Jorm, 2004).
- Examination of proxy mental health (anxiety, depression, distress, carer burden) and the quality of the relationship between the informant and patient on IQCODE scores. Answering an important question related to validity of the proxy instrument: To what extent is the patient's actual cognitive ability modified by the informant's perceptions of everyday functioning and behaviour?
- IQCODE scores in relation to other types of proxy informants (formal, informal or other family members) could be examined. This work could use an inter-rater reliability framework (NB: The ten-year timeframe would probably have to be changed for such a study).
- Updated age related population norms are required which also examine floor and ceiling effects.

Reporter: Nicholas Marosszeky

Date of report: April 2010

References

Arnold AM, Newman AB, Dermond N, et al (2009) *Using telephone and informant assessments to estimate missing Modified Mini-Mental State Exam scores and rates of cognitive decline. The cardiovascular health study.* Neuroepidemiology. Vol. 33, pp.55-65.

Barber M, Tait RC, Scott J, et al (2004) *Dementia in subjects with atrial fibrillation: hemostatic function and the role of anticoagulation.* Journal of Thrombosis & Haemostasis. Vol. 2, pp.1873-1878.

Bottino CM, Zevallos-Bustamante SE, Lopes MA, et al (2009) *Combined instruments for the screening of dementia in older people with low education.* Arquivos de Neuro-Psiquiatria. Vol. 67, pp.185-190.

Bruce DG, Harrington N, Davis WA, et al (2001) *Dementia and its associations in type 2 diabetes mellitus: the Fremantle Diabetes Study.* Diabetes Research & Clinical Practice. Vol. 53, pp.165-172.

Burns A, Lawlor B and Craig S (2004) *Assessment scales in old age psychiatry (2nd ed.)*. Taylor & Francis, London.

Butt Z and Butt Z (2008) *Sensitivity of the informant questionnaire on cognitive decline: an application of item response theory.* Aging Neuropsychology & Cognition. Vol. 15, pp.642-655.

Cherbuin N, Anstey KJ, Lipnicki DM, et al (2008) *Screening for dementia: a review of self- and informant-assessment instruments.* International Psychogeriatrics. Vol. 20, pp.431-458.

Cordonnier C, Henon H, Derambure P, et al (2007) *Early epileptic seizures after stroke are associated with increased risk of new-onset dementia.* Journal of Neurology, Neurosurgery & Psychiatry. Vol. 78, pp.514-516.

- de Abreu ID, Nunes PV, Diniz BS, et al (2008) *Combining functional scales and cognitive tests in screening for mild cognitive impairment at a university-based memory clinic in Brazil*. Revista Brasileira de Psiquiatria. Vol. 30, pp.346-349.
- de Rooij SE, Govers AC, Korevaar JC, et al (2008) *Cognitive, functional, and quality-of-life outcomes of patients aged 80 and older who survived at least 1 year after planned or unplanned surgery or medical intensive care treatment*. Journal of the American Geriatrics Society. Vol. 56, pp.816-822.
- Diesfeldt HFA (2007) *Erratum: Informant based measures may overestimate cognitive impairment in elderly patients*. International Journal of Geriatric Psychiatry. Vol. 23, pp.226-227.
- Ehrensperger MM, Berres M, Taylor KI, et al (2010) *Screening properties of the German IQCODE with a two-year time frame in MCI and early Alzheimer's disease*. International Psychogeriatrics. Vol. 22, pp.91-100.
- Farias ST, Mungas D, Reed B, et al (2004) *Everyday functioning in relation to cognitive functioning and neuroimaging in community-dwelling Hispanic and non-Hispanic older adults*. Journal of the International Neuropsychological Society. Vol. 10, pp.342-354.
- Fritsch T, Smyth KA, McClendon MJ, et al (2005) *Associations between dementia/mild cognitive impairment and cognitive performance and activity levels in youth*. Journal of the American Geriatrics Society. Vol. 53, pp.1191-1196.
- Hancock P and Lerner AJ (2009) *Diagnostic utility of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) and its combination with the Addenbrooke's Cognitive Examination-Revised (ACE-R) in a memory clinic-based population*. International Psychogeriatrics. Vol. 21, pp.526-530.
- Hototian SR, Lopes MA, Azevedo D, et al (2008) *Prevalence of cognitive and functional impairment in a community sample from Sao Paulo, Brazil*. Dementia & Geriatric Cognitive Disorders. Vol. 25, pp.135-143.
- Isella V, Villa L, Russo A, et al (2006) *Discriminative and predictive power of an informant report in mild cognitive impairment*. Journal of Neurology, Neurosurgery & Psychiatry. Vol. 77, No.2, pp.166-171.
- Jackson JC, Obremskey W, Bauer R, et al (2007) *Long-term cognitive, emotional, and functional outcomes in trauma intensive care unit survivors without intracranial hemorrhage*. Journal of Trauma-Injury Infection & Critical Care. Vol. 62, pp.80-88.
- Jansen AP, van Hout HP, Nijpels G, et al (2008) *Self-reports on the IQCODE in older adults: a psychometric evaluation*. Journal of Geriatric Psychiatry & Neurology. Vol. 21, pp.83-92.
- Jorm AF and Jacomb PA (1989) *An Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): Socio-demographic correlates, reliability, validity and some norms*. Psychological Medicine. Vol. 19, pp.1015-1022.
- Jorm AF (2004) *The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): A review*. International Psychogeriatrics. Vol. 16, pp.275-293.
- Klimkowicz A, Dziedzic T, Polczyk R, et al (2004) *Factors associated with pre-stroke dementia: the cracow stroke database*. Journal of Neurology. Vol. 251, pp.599-603.
- Knafelc R, Lo Giudice D, Harrigan S, et al (2003) *The combination of cognitive testing and an informant questionnaire in screening for dementia*. Age & Ageing. Vol. 32, pp.541-547.
- Langley LK (2004) *Cognitive Assessment of Older Adults (Chapter 4)*. In Kane RL, Kane RA, (eds). Assessing older persons: measures, meaning and practical applications. USA: Oxford University Press.
- Lim HJ, Lim JPiP, Philomena A, et al (2003) *Prevalence of cognitive impairment amongst Singapore's elderly Chinese: A community-based study using ECAQ and IQCODE*. International Journal of Geriatric Psychiatry. Vol. 18, pp.142-148.
- Lopes MA, Hototian SR, Bustamante SE, et al (2007) *Prevalence of cognitive and functional impairment in a community sample in Ribeirao Preto, Brazil*. International Journal of Geriatric Psychiatry. Vol. 22, pp.770-776.

Mackinnon A, Khalilian A, Jorm AF, et al (2003) *Improving screening accuracy for dementia in a community sample by augmenting cognitive testing with informant report.* Journal of Clinical Epidemiology. Vol. 56, pp.358-366.

McCusker J, Cole MG, Dendukuri N, et al (2004) *The Delirium Index, a Measure of the Severity of Delirium: New Findings on Reliability, Validity, and Responsiveness.* Journal of the American Geriatrics Society. Vol. 52, pp.1744-1749.

McDowell I (2006) *Measuring Health: A Guide to Rating Scales and Questionnaires (3rd ed.)*. Oxford University Press, USA.

Priner M, Jourdain M, Bouche G, et al (2008) *Usefulness of the short IQCODE for predicting postoperative delirium in elderly patients undergoing hip and knee replacement surgery.* Gerontology. Vol. 54, pp.116-119.

Mok VC, Wong A, Lam WW, et al (2004) *Cognitive impairment and functional outcome after stroke associated with small vessel disease.* Journal of Neurology, Neurosurgery & Psychiatry. Vol. 75, pp.560-566.

Mok V, Wong A, Tang WK, et al (2005) *Determinants of prestroke cognitive impairment in stroke associated with small vessel disease.* Dementia & Geriatric Cognitive Disorders. Vol. 20, pp.225-230.

Narasimhalu K, Lee J, Auchus AP, et al (2008) *Improving detection of dementia in Asian patients with low education: combining the Mini-Mental State Examination and the Informant Questionnaire on Cognitive Decline in the Elderly.* Dementia & Geriatric Cognitive Disorders. Vol. 25, pp.17-22.

Pasquini M, Leys D, Rousseaux M, et al (2007) *Influence of cognitive impairment on the institutionalisation rate 3 years after a stroke.* Journal of Neurology, Neurosurgery & Psychiatry. Vol. 78, pp.56-59.

Pratt LA, Weeks JD, Goulding MR, et al (2008) *Measures of cognitive functioning in the 1994-2000 Second Longitudinal Study of Aging.* National health statistics reports. No.2, pp.1-15.

Perroco TR, Bustamante SE, Moreno Mdel P, et al (2009) *Performance of Brazilian long and short IQCODE on the screening of dementia in elderly people with low education.* International Psychogeriatrics. Vol. 21, No.3, pp.531-538.

Potter GG, Plassman BL, Burke JR, et al (2009) *Cognitive performance and informant reports in the diagnosis of cognitive impairment and dementia in African Americans and whites.* Alzheimer's & Dementia. Vol. 5, pp.445-453.

Sansoni J, Marosszeky N, Jeon Y-H, et al (2008) *Final Report: Dementia Outcomes Measurement Suite Project.* Centre for Health Service Development, University of Wollongong.

Schuurmans MJ, Shortridge-Baggett LM, Duursma SA, et al (2003) *The Delirium Observation Screening Scale: a screening instrument for delirium.* Research & Theory for Nursing Practice. Vol. 17, pp.31-50.

Serrano S, Domingo J, Rodriguez-Garcia E, et al (2007) *Frequency of cognitive impairment without dementia in patients with stroke: a two-year follow-up study.* Stroke. Vol. 38, pp.105-110.

Srikanth V, Thrift AG, Fryer JL, et al (2006) *The validity of brief screening cognitive instruments in the diagnosis of cognitive impairment and dementia after first-ever stroke.* International Psychogeriatrics. Vol. 18, pp.295-305.

Tang WK, Chan SS, Chiu HF, et al (2004) *Frequency and determinants of prestroke dementia in a Chinese cohort.* Journal of Neurology. Vol. 251, pp.604-608.

Tokuhara KG, Valcour VG, Masaki KH, et al (2006) *Utility of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) for dementia in a Japanese-American population.* Hawaii Medical Journal. Vol. 65, pp.72-75.

Viswanathan A, Patel P, Rahman R, et al (2008) *Tissue microstructural changes are independently associated with cognitive impairment in cerebral amyloid angiopathy.* Stroke. Vol. 39, pp.1988-1992.
Wacker P, Nunes PV, Cabrita H, et al (2006) *Post-operative delirium is associated with poor cognitive outcome and dementia.* Dementia & Geriatric Cognitive Disorders. Vol. 21, pp.221-227.

Wrobel NH and Farrag MF (2008) *Preliminary validation of an Arabic version of the MMSE in the elderly*. Clinical Gerontologist: The Journal of Aging and Mental Health. Vol. 31, pp.75-93.

Rowland Universal Dementia Assessment Scale

Note this review is reprinted with the permission of the authors of the Dementia Outcome Measurement Suite project (Sansoni et al., 2008).

Title:	Rowland Universal Dementia Assessment Scale.
Abbreviations:	RUDAS.
Author(s) Name:	Joella E Storey, Jeffrey T.J. Rowland, David A Conforti and Hugh G Dickson.
Author(s) Address:	Joella E Storey, Aged Care Research Liverpool Hospital Locked Bag 7103 Liverpool BC NSW 1871 Australia
Supplied by:	The instrument is available from the authors, with permission.
Cost:	\$15.00 (includes training video, books and scoring sheets).
Training requirements:	Approximately 40 minutes of training (using videotape).
Purpose:	Short cognitive screening tool, for the assessment of dementia.
Administration time:	10 minutes.
Instrument Type:	Interviewer administered, patient response questionnaire.
Structure:	Six item questionnaire covering the following cognitive domains: <ul style="list-style-type: none">- Memory (memorise and delayed recall of 4 shopping items);- Visuo-spatial orientation (naming part of the body);- Praxis (hand fist exercise);- Visuo-constructional drawing (cube drawing);- Judgement (person describes what they would do if they need to cross a busy street with no crossing or traffic lights);- Language (number of animals named in 1 minute).
Scoring:	The instrument is scored out of 30 with scores below 23 suggesting dementia. Item scores are summed to give a total score. Individual items scores are as follows: <ul style="list-style-type: none">- Memory: 2 points for each item recalled. Total possible score = 8.- Visuo-spatial orientation; 1 point for each body part correctly identified, once 5 correct parts are identified, this section is discontinued. Total possible score = 5.- Praxis: 3 point scale – 0 = failed, 1 = partially/adequate, 2 = normal. Total possible score = 2.- Visuo-constructional drawing: 1 point for each of base drawn, all internal lines appear, and all external lines appear. Total possible score = 3.

- Judgement Items: 2 points for each for: look for traffic, additional safety proposal. Total possible score = 4.
- Language: 1 point for each animal named. This section is discontinued after 8 animals have been named. Total possible score = 8.

Developed for:	Assessment of cognitive impairment/dementia in culturally diverse populations.
Normative Data:	This is a relatively new instrument and normative data is not available at this stage.
Clinical Data:	Storey et al. (2004) provide clinical data on 166 geriatric medicine outpatients when developing the scale.
Applications:	Assessment of cognitive status, at diagnosis stage, over time, and as an outcome measure.
Carer and/or Patient Use of Instrument:	Interviewer administered; patient response questionnaire.

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale.</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale.</p>		<input type="checkbox"/> Alpha >0.70 <input type="checkbox"/> Marginal or inadequate internal consistency (<0.70) <input checked="" type="checkbox"/> No information found on internal consistency	No information found at the time of this review.
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	Storey, Rowland, et al. (2004)	<input checked="" type="checkbox"/> ICC >.70 Time intervals and confidence intervals reported <input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70 <input type="checkbox"/> No information found on test-retest reliability	Excellent test-retest reliability with ICC of 0.98.
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of</p>	Storey, Rowland, et al. (2004)	<input checked="" type="checkbox"/> Agreement reported and adequate <input type="checkbox"/> Inadequate inter-	Excellent inter-rater reliability with ICC of 0.99.

measurement (SEM) were presented		rater agreement <input type="checkbox"/> No information provided	
----------------------------------	--	---	--

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>	Storey, Rowland, et al. (2004)	<input type="checkbox"/> Patients and experts were involved during item selection and/or item reduction <input checked="" type="checkbox"/> Patients were consulted for reading and comprehension <input type="checkbox"/> No patient involvement <input type="checkbox"/> No information found on content validity <input checked="" type="checkbox"/> There is an adequate coverage of relevant domains <input type="checkbox"/> There is limited coverage of relevant domains	Developed by a team of experts the field of dementia care, in consultation with representatives from 22 cultural and linguistic groups.
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured.</p>		<input type="checkbox"/> Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used <input type="checkbox"/> Limited /inadequate construct validity reported <input checked="" type="checkbox"/> No information provided	
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	Storey, Rowland, et al. (2004)	<input type="checkbox"/> No evidence provided/failed a test of dimensionality <input checked="" type="checkbox"/> Some evidence provided to support internal structure <input type="checkbox"/> Substantial evidence provided to support internal structure	Item – total correlations ranged from 0.35 to 0.50.
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	Rowland, Basic, et al. (2006b)	<input checked="" type="checkbox"/> Correlations with other measures are reported <input type="checkbox"/> Correlations not reported	Scores significantly correlated with Mini-Mental State Exam (MMSE).
<p>Construct: Discriminant Validity</p> <p>The scale differentiates</p>	Storey, Rowland, et al. (2004) Rowland, Basic, et al. (2006a)	<input checked="" type="checkbox"/> Scale differentiates between relevant categories of respondents	Instrument has good diagnostic accuracy. Studies show Area under the receiver operated curves (ROC) figures

between relevant categories of respondent e.g. sick vs. well, varying degrees of severity	lype, Ajitha, et al. (2006)	<input type="checkbox"/> No information on discriminant validity	ranging from 0.86 to 0.94, sensitivity and specificity ranging from 72 to 89% and 76 to 100%. These are better than for MMSE and GPCOG.
Criterion Information on the relationship of scores to gold standard measures or clinical diagnosis is provided		<input type="checkbox"/> Comparison made to criterion measures X No comparison with criterion measures provided	
Interpretability The degree to which one can assign qualitative meaning to quantitative scores Do authors provide the following : Presentation of means and SD of scores before and after treatment Comparative data on the distribution of scores in relevant subgroups Information on the relationship of scores to well-known functional measures or clinical diagnosis Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced	Storey, Rowland, et al. (2004) Rowland, Basic, et al. (2006a) Rowland, Basic, et al. (2006b) lype, Ajitha, et al. (2006)	X Authors provide 2 or more types of information on interpretability <input type="checkbox"/> Authors provide limited information to assist with interpretability <input type="checkbox"/> No information provided	Studies provide means, standard deviations and confidence intervals. They also provide information on relationship of scores to other measures.

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
Floor and ceiling effects The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved Authors should provide descriptive statistics of the distribution of scores		<input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects detected <input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score X No information provided on floor and ceiling effects	No studies available.

<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>		<p><input type="checkbox"/> Hypotheses were formulated and results were in agreement</p> <p><input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard)</p> <p>X No information on sensitivity to change was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful</p> <p>X MCID – No information was provided.</p>	<p>No studies available.</p>

Cultural Applicability and Cultural Adaptations:

The RUDAS items can be directly translated and are relevant to most cultures. It can be easily used with persons from Non English Speaking Backgrounds with the help of an interpreter. It can also be readily translated into other languages without the need to change the structure or the format of any item. One item may not be appropriate for use with Indigenous people in remote locations and its applicability for use with Indigenous peoples needs to be assessed.

Gender Appropriateness:

Appropriate for use with both genders.

Age Appropriateness:

Appropriate for use with adults.

Summary:

The RUDAS is a short multicultural cognitive screening tool for the assessment of dementia. It was developed and validated in an area where 40% of the population are born in non-English speaking countries and more than 80 languages are spoken. Developers included experts in the field of dementia care and representatives from 22 cultural and linguistic groups. The items are culturally fair and easily translated. The instrument is interviewer administered and takes about 10 minutes to complete. Training is required but is readily available at a low cost of \$15.00. Evidence relating to psychometric properties is limited as the instrument is new, but existing data is promising with results indicating the instrument is valid and reliable.

Reporter:

Madeleine King and Siggi Zapart

Date of report:

19/1/07

References

Iype T, Ajitha BK, Antony P, et al. (2006) *Usefulness of the Rowland Universal Dementia Assessment scale in South India*. Journal of Neurology, Neurosurgery & Psychiatry. Vol. 77, No.4, pp.513-4.

Rowland JT, Basic D, Conforti DA, et al. (2006a) *The predictive accuracy of the RUDAS compared to the MMSE and GPCOG for classification of cognitive impairment*. Royal Australasian College of Physicians Internal Medicine Journal. Vol. 36, No. Supp 5, pp.A163-188.

Rowland JT, Basic D, Storey JE, et al. (2006b) *The Rowland Universal Dementia Assessment Scale (RUDAS) and the Folstein MMSE in a multicultural cohort of elderly persons*. International Psychogeriatrics. Vol. 18, No.1, pp.111-20.

Storey JE, Rowland JT, Basic D, et al. (2004) *The Rowland Universal Dementia Assessment Scale (RUDAS): a multicultural cognitive assessment scale*. International Psychogeriatrics. Vol. 16, No.1, pp.13-31.

Attachment 6: Other Relevant Instrument Reviews from the Dementia Outcomes Measurement Suite

Geriatric Depression Scale

Note this review is reprinted with the permission of the authors of the Dementia Outcome Measurement Suite project (Sansoni et al., 2008).

Title:	Geriatric Depression Scale.
Abbreviations:	GDS.
Author(s) Name:	Jerome A. Yesavage, M.D. T.L. Brink, PhD.
Author(s) Address:	Jerome A. Yesavage, M.D. Director Aging Clinical Research Center Department of Psychiatry and Behavioral Sciences Stanford University School of Medicine Stanford CA, 94305 – 5548.
Supplied by:	Visit the following web-site: http://www.stanford.edu/%7Eyesavage/GDS.html
Cost:	In the public domain (see above).
Training requirements:	Minimal.
Purpose:	To assess and screen depression in elderly people, using an instrument that was simple to administer and did not require interviewer training (Burns et al., 2004).
Administration time:	5 – 10 minutes.
Instrument Type:	Self-administered or interviewer administered questionnaire.
Structure:	30 questions with dichotomous (Yes / No) response items producing a total score. The dichotomous (Yes / No) response format of the GDS is contentious, as it is different to other depression scales. This has generated a number of research papers which are summarised below. Olin et al. (1992) reports that GDS produces similar results to that of the BDI for older adults; while being simpler for them to complete as it is based on dichotomous responses not multiple responses. Dunn and Sacco (1989) also report a lower complication rate for the GDS than the Zung Self Rating Depression Scale, because of its dichotomous response format. Lyness et al. (1997) also comments on the easier administration format. However, Fischer et al. (1996) in their content analysis found that older people found the Yes / No format restrictive and changed question descriptors. They also tried to fill in the context e.g. my mood is affected by my health, personal relationships, and talked about their personal style rather than depression. Fischer et al. (1996) suggest that certain personality profiles and situations may influence reporting.

A paper by Dunn and Sacco (1988) randomly assigned a community sample of older people into four groups, changing the reference group instructions for the GDS (no instruction, age group peers, adults in general, themselves when younger) and found that their responses did not change greatly.

Cannon et al. (2002) found significant test-retest correlations between the oral and written administration formats of the GDS for cognitively intact participants. The same could not be said for those who were cognitively impaired (testing was completed over one session).

Scoring:

There is 0 or 1 scoring of the Yes / No responses to produce a total score out of 30. Answers indicating depression are scored 1 and those not indicating depression are scored 0 (can be either yes or no responses).

Score in the following ranges suggest:

- 0 – 9 = Not depressed
- 10 – 19 = Mild depression
- 20 – 30 = Severe depression

(Source: PROQOLID website)

Scores can also be prorated if items are missing.

A 15 item version (GDS-15) was developed to reduce the chance of test fatigue in physically ill or demented patients (Shiekh and Yesavage, 1986). It takes 5 minutes to use and has a cut-score of 5 (see Web-site, PROQOLID and Bijl et al., 2005). The GDS-15 has high correlations with (0.84 – 0.89), and similar properties to, the GDS-30 (Leshner and Beeryhill 1994; Wall et al., 1999; Aikman & Oehlert, 2001). However, Bowling (2005) and McDowell (2006), cite a paper by Alden et al. (1989) which found a low correlation of 0.66 between the two versions in a community sample. Ingram (1996) also found poor agreement between the GDS-30 and GDS-15 and lower test-retest reliability for the GDS-15 ($r = 0.67$) in the community sample (GDS-15 was extracted).

This work highlights an emerging issue with the GDS that choosing the site of administration is very important. Blank et al. (2004) suggests that the GDS works best in residential care settings.

Developed for:

The GDS was developed from a pool of 100 items generated by clinicians and researchers (Bowling, 2005) which was reduced to 30 items on the grounds of high item-total correlations.

An advantage of the GDS is that it does not include somatic symptoms but focuses on the affective aspects of depression (PROQOLID; Bowling, 2005; McDowell, 2006). As McDowell (2006) explains: "Symptoms indicative of depression in young people (e.g. sleep disturbance, weight loss, pessimism about the future), may also occur in the elderly as normal effects of aging or as a result of a physical illness." Using an instrument with somatic symptoms items may result in false positive cases (Bowling, 2005).

It should be noted however that the use of somatic items is open to some debate in the literature. The view that by excluding somatic items that the GDS is a better measure of depression in the elderly is supported by Bolla-Wilson and Bleecker (1989) and Salamero and Marcos (1992). However, Norris and Woehr (1998) using the BDI, CES-D and GDS found that some somatic items (diminished energy, sleep disturbance and health worries) were consistent with depression.

Normative Data:

Recent normative data from those aged 75 years and over in the United Kingdom is provided by Osborn et al., (2002). McDowell reports a mean of 5.6 (SD= 4.4) for a group of healthy seniors (60 – 95 years of age).

Clinical Data:

The GDS has been used widely in many clinical studies, applicable to older adults. Below are some highlights:

- Abdominal surgery: Zalon 2004
- Adverse drug reactions: Onder et al. (2003)
- Cancer treatment: Chen et al. (2003)
- Carers: Meara et al. (1999), Shua-Haim et al. (2001), Mittelman et al. (2004)
- Chronic obstructive pulmonary disease (COPD): Almagro et al. (2002)
- Delirium: Leung et al. (2005)
- Estrogen replacement: Carlson et al. (2000)
- Fatigue: Ingles, et al. (1999), Liao and Ferrell (2000), Crane (2005)
- Heart disease: Vaccarino et al. (2001), Mallik et al. (2005)
- Hip replacement surgery: Kurlowicz, (1998)
- Medication management: Edelberg et al. (2000)
- Memory complaints: Collins and Abeles, (1996), Levy-Cushman and Abeles, (1998)
- Mental health: Segal et al. (1998), Soref and DeVries, (2005)
- Neuropsychological impairment: Massman et al. (1996), Nebes et al. (2001), Jackson et al. (2003), Mast et al. (2004), Vinkers et al. (2005)
- Pain management: Parmelee et al. (1991a), Bishop et al. (2001), Schuler et al. (2004)
- Parkinson's disease: Ertan et al. (2005), McDonald et al. (2006), Mondolo et al. (2006), Weintraub et al. (2006)
- Polio survivors: Kemp et al. (1997)
- Preferences for life sustaining therapy: Lee and Ganzini, (1994)
- Psychological resilience: Ferraro (2003)
- Rehabilitation: Diamond et al. (1995), Barbisoni et al. (1996), Mast et al. (1999), Sood et al. (2003), Cully et al. (2005a)
- Rheumatoid arthritis: Katz and Yelin, (1995)
- Spirituality: Koenig et al. (1992), Klaas et al. (1998)
- Stroke: Nir et al. (2004), Kwok et al. (2006)
- Testosterone replacement: Kenny et al. (2004)
- Transition to nursing home: Krichbaum et al. (1999)
- Vitamin B12 Deficiency: Penninx et al. (2000)
- Visual impairment: Shmueli-Dulitzki et al. (1997), Galaria et al. (2000)

Also there is some literature that clinicians have problems recognising depression in elderly patients and this has been shown in studies using the GDS as a measure of depression symptoms (Rapp et al., 1988; Pond et al., 1990; Jackson and Baldwin, 1993; Garrard et al., 1998; Bagley et al., 2000; Peach et al., 2001 and Ruchinkas, 2002). This may be confounded by dementia severity / cognitive status (Snowdon and Lane, 1999; Ruchinkas 2002). This co-morbid situation (i.e. mixing depression and cognitive impairment) also affects estimates based on cut-scores from other psychometric instruments like the MMPI and BSI, as well as the GDS (Harper et al., 1990).

Applications:

Additional short versions of 10 and 4 items each have been developed by D'Ath et al. (1994), van Marwijk et al. (1995), Shah et al. (1997) and Almeida & Almeida (1999). Hoyle et al. (1999), Rinaldi et al. (2003) and Storaandt (2005) have developed a 5 item version). These versions have produced good correlations and similar detection properties to the GDS-30 and GDS-15, using ICD-10, DSM-IV, and diagnostic interviews / schedules. Single item versions of the GDS have proved unsatisfactory.

Suttcliffe et al. (2000) have developed a new short form of the GDS, the GDS-12R, for residential care.

Nitcher et al. (1993) have developed a proxy version of the scale for those with mild to moderate cognitive impairment (though due the tendency of carers to endorse more symptoms, higher cut-scores are required). Brown and Schinka (2005) have also developed an informant version of the GDS-15.

The web-site suggests how the instrument can be used with aphasic patients. McDowell (2006) reported that a telephone format is also available.

In further developments:

- Arthur et al. (1999) used the GDS-15 in an annual over 75 health check.
- Cully et al. (2005b) have developed a 2-item screener for depression in rehabilitation inpatients based on the GDS.
- Recently, Segulin and Deponte (2007) have developed a modified version of the GDS for very old persons.

In terms of using the GDS with people with cognitive impairment, McDowell (2006) states that "In elderly people, depression commonly coexist with dementia; cognitive problems compromise the accuracy of self-reports just as depression may mask cognitive abilities." This not surprising as the GDS is a recall task. McDowell (2006) recommends supplementing the measure by informant information.

Here McDowell (2006) reflects the majority view that there are problems with the GDS when used with people with mild to moderate dementia / cognitive impairment (refer to papers by Burke et al., 1989; Kafonek et al., 1989; Burke et al., 1991; Montorio and Izal, 1996; Gilley and Wilson, 1997; Cannon et al., 2002; de Craen et al., 2003; Bedard et al., 2003; Korner et al., 2006). However, the evidence is not so clear cut, with papers by Parmelee et al. (1989), O'Rordan et al. (1990) Feher et al. (1992), Burke et al. (1992), Suttcliffe et al. (2000), Jongenelis et al. (2005) saying it is acceptable to use the GDS with people with mild to moderate cognitive impairment. However, the GDS is not recommended for people with moderately severe or severe dementia.

Finally, the complex relationship between depression and cognitive impairment in the elderly has been studied in detail by Parmelee et al. (1991b), Lichtenberg et al. (1995) and Vinkers et al. (2004a) using the GDS. From these studies, it seems that by examining depression as well as cognitive performance one can account for a greater amount of variance in cognitive test score results.

Carer and/or

Patient Use of Instrument:

The GDS is a self-administered or interviewer administered questionnaire.

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	<p>Brink et al. (1982) Lyons et al. (1989) Abraham (1991) Sutcliffe et al. (2000) Jefferson et al. (2001) Incalzi et al. (2003) Iglesias (2004) Friedman et al. (2005) Bowling (2005) McDowell (2006) PROQOLID</p>	<p>X Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>PROQOLID reports 0.94 as the internal consistency for healthy patients and those treated for depression. However, some investigators have found slightly lower reliability (Bowling, 2005 see also Jefferson et al. (2001) and Iglesias (2004) who found 0.83 – 0.84 and Friedman, et al. 2005). Further details with different populations including younger age groups are provided by McDowell (2006).</p> <p>Abraham (1991) found reliabilities (KR-20) in the range of 0.69 – 0.88 (mean 0.82) older people assessed 18 times over a 39 week period in a residential care setting.</p> <p>However, a poor alpha of 0.46 was reported for the GDS-15 by Incalzi et al. (2003) with older medical inpatients.</p> <p>Sutcliffe et al. (2000) improved the reliability of the GDS-15 by removing three items when used in a residential care setting.</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>	<p>Brink et al. (1983) Parmelee et al. (1989) Burns et al. (2004) Bowling (2005)</p>	<p>X ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input type="checkbox"/> No information found on test-retest reliability</p>	<p>Brink et al. (1983) found the following test-retest reliabilities in a residential care setting: 0.86 for one hour; 0.85 for one week; and 0.98 10 – 12 days.</p> <p>This is supported by Parmelee et al. (1989) and Ingram (1996).</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	<p>Brink et al. (1982) Bowling (2005) McDowell (2006)</p>	<p>X Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p><input type="checkbox"/> No information provided</p>	<p>Correlation coefficient of 0.85 (Brink et al. 1982).</p>

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>	<p>Weiss et al. (1986) Adams (2001) Bowling (2005)</p>	<p><input type="checkbox"/> Patients and experts were involved during item selection and/or item reduction</p> <p><input type="checkbox"/> Patients were consulted for reading and comprehension</p> <p><input checked="" type="checkbox"/> No patient involvement</p> <p><input type="checkbox"/> No information found on content validity</p> <p><input checked="" type="checkbox"/> There is an adequate coverage of relevant domains</p> <p><input type="checkbox"/> There is limited coverage of relevant domains</p>	<p>GDS was developed from items generated by clinicians and researchers (Bowling, 2005).</p> <p>It appears to miss some themes for the older person (Weiss et al. 1986).</p> <p>Adams (2001) argues that some items of the GDS are measuring social withdrawal rather than depression.</p> <p>Specific data on readability of each item was not found. (As opposed to item format – multiple response vs. dichotomous response).</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>Parmelee et al. (1989) Cappeliez et al. (1989) Salamero and Marcos (1992) Cuijpers and van Lammeren (1999) Gazmararian et al. (2000) Daaleman et al. (2002) Incalzi et al. (2003) Burns et al. (2004) Friedman et al. (2005) Heisel et al. (2005) Onishi et al. (2006)</p>	<p><input checked="" type="checkbox"/> Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <p><input type="checkbox"/> Limited /inadequate construct validity reported</p> <p><input type="checkbox"/> No information provided</p>	<p>Low correlation with cognition scores (MMSE) (Onishi, 2006; McDowell, 2006).</p> <p>Relationship to depressed mood, life satisfaction and suicidal ideation is reported by Friedman et al. (2005). A paper by Heisel et al. (2005) also supports the relationship suicidal ideation.</p> <p>Scores on the GDS have a negative relationship with spirituality (Daaleman et al., 2002). in accord with other literature in this area it correlates with HDRS - Melancholia Scale 0.77 (Salamero and Marcos, 1992).</p> <p>GDS correlates with function and health status but on the whole the associations are modest and negative (Parmelee et al., 1989; Cuijpers and van Lammeren, 1999; Gazmararian et al., 2000; Incalzi et al., 2003; Onishi et al., 2006).</p> <p>There is evidence of immunity to social desirability – Cappeliez et al. (1989).</p> <p>Burns et al. (2004) query its validity with people with dementia. See also the section on Construct: Correlation with other Measures.</p>

<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	<p>Parmelee et al. (1989) Sheikh et al. (1991) Salamero and Marcos (1992) Adams (2001) Incalzi et al. (2003) Adams et al. (2004) Friedman et al. (2005) Tang et al. (2005) Onishi et al. (2006)</p>	<p><input type="checkbox"/> No evidence provided/failed a test of dimensionality <input type="checkbox"/> Some evidence provided to support internal structure <input checked="" type="checkbox"/> Substantial evidence provided to support internal structure</p>	<p>The picture emerging from the literature suggests a basic uni-dimensional structure with approximately five sub dimensions (Parmelee et al., 1989; Sheikh et al., 1991; Salamero and Marcos, 1992; Friedman et al., 2005; Onishi et al., 2006; and Tang et al., 2005 which uses Rasch analysis). However, care is needed when examining studies with regard to clinical versus community samples and related settings (see Onishi et al. (2006) for a detailed description of the different pattern types across settings). Friedman et al. (2005) notes the emergence of an additional positive affect factor in primary care settings. Plus other contrary structures are reported by Incalzi et al. (2003) with older medical inpatients). Finally the work of Adams (Adams, 2001; Adams et al., 2004) suggests the emergence of an Apathy (Withdrawal-Apathy-Vigor) sub- dimension, also known as depression without sadness. This sub- dimension may lead to an over-identification of the symptoms of depression.</p>
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Dunn and Sacco (1989) Feher et al. (1992) Brink and Niemeyer (1992) Coleman et al. (1995) Ferraro and Chelminski (1996) Clayton et al. (1997) McCurren et al. (1999) Jefferson et al. (2001) Costa et al. (2003) Iglesias (2004) Meeks (2004) Kerber et al. (2005) Bowling (2005) McDowell (2006)</p>	<p><input checked="" type="checkbox"/> Correlations with other measures are reported <input type="checkbox"/> Correlations not reported</p>	<p>Extensively researched. Here are some highlights: Correlation with HRSD = 0.62 – 0.81 (Bowling, 2005). Feher et al. (1992) finds HDRS is a major predictor of GDS scores.</p> <p>Correlation with BDI = approximately 0.85 (Ferraro and Chelminski, 1996; Bowling, 2005). Correlation with BDI-II = 0.71 in a sample of older women (Jefferson et al., 2001).</p> <p>Correlation with Montgomery-Asberg DRS = 0.82 (McDowell, 2006).</p> <p>Meeks (2004) finds GDS superior to Minimum Data Set (MDS) – Depression scale in residential care. Kerber et al., (2005) also finds little association between the two measures. See also McCurren et al. (1999).</p>

			<p>Correlation with Zung Self-Rating Depression Scale = 0.76 for homebound elders (Iglesias, 2004). See also Dunn and Sacco (1989).</p> <p>GDS correlates with other well-being / self-esteem measures Philadelphia Center Morale Scale, Southampton Self-Esteem Scale and Bradburn Affect Balance Scale. Coleman et al. (1995) questions the use of these measures in addition to GDS.</p> <p>Correlation with GHQ-12 = 0.5 – 0.6 (kappa) with elderly population in Brazil (Costa et al., 2003).</p> <p>Clayton et al. (1997) reports that GDS works better in picking up depression symptoms than the HRSD in elderly anxiety patients.</p> <p>The GDS has higher correlation with measures of life satisfaction than CES-D in college students. Correlation CES-D and GDS = 0.66 (Brink and Niemeyer, 1992).</p> <p>Finally, Korner et al. (2006) in Denmark provides a direct comparison study with the Cornell Scale for Depression (CSDD) highlighting that the CSDD performs better in both dementia and non-dementia samples. While the GDS has diminished validity in dementia samples.</p>
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Litchenberg et al. (1992) D'Ath et al. (1994) Lyness et al. (1997) Watson and Pigone (2003) Bowling (2005) Jongenelis et al. (2005) McDowell (2006) Wancata et al. (2006) PROQOLID</p>	<p>X Scale differentiates between relevant categories of respondents <input type="checkbox"/> No information on discriminant validity</p>	<p>Distinguishes mild from moderate and severe depression (PROQOLID).</p> <p>Sensitivity high, though specificity is lower (Bowling, 2005).</p> <p>Similar or better when compared with other measures e.g. CES-D, BDI and diagnostic interviews / schedules. For further details see Lyness et al. (1997) for CES-D as well as Litchenberg et al. (1992), D'Ath et al. (1994), Jongenelis et al. (2005). There are also two systematic reviews by Watson and Pigone (2003) and Wancata et al. (2006).</p> <p>Commenting on one study McDowell (2006) states that</p>

			these discriminant properties apply "almost identically" to both the 30 and 15 item long versions of the GDS.
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>	<p>Rapp et al. (1988) Parmelee et al. (1989) Lichtenberg et al. (1992) Jackson and Baldwin (1993) Almeida and Almeida (1999) Watson and Pigone (2003) Friedman et al. (2005) Bowling (2005) Wancata et al. (2006)</p>	<p>X Comparison made to criterion measures <input type="checkbox"/> No comparison with criterion measures provided</p>	<p>Performs just as well or better than the Hamilton Rating Scale for Depression (HRSD) in discriminating elderly people at different severity levels when compared with Research Diagnostic Criteria, DSM-IV criteria, ICD-10 criteria, structured psychiatric interviews (Lichtenberg et al., 1992; Jackson and Baldwin, 1993; Almeida and Almeida, 1999; Bowling, 2005).</p> <p>Similar comparisons were found with the CES-D by Wancata et al. (2006) and Watson and Pigone (2003).</p> <p>This is also supported by Rapp et al. (1988) using the BDI.</p> <p>However, some problem in detecting minor depression is noted by Parmelee et al. (1989). There is also a low correlation with suicide attempts in the community (Friedman et al. 2005).</p>
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>		<p>X Authors provide 2 or more types of information on interpretability <input type="checkbox"/> Authors provide limited information to assist with interpretability <input type="checkbox"/> No information provided</p>	<p>See the sections on Construct Validity and Sensitivity to Change.</p> <p>Note: Mixed results with cognitively impaired / people with dementia.</p>

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>	<p>Osborn et al. (2002)</p>	<p>X Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects detected</p> <p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score</p> <p><input type="checkbox"/> No information provided on floor and ceiling effects</p>	<p>In a large community sample of people 75 years and over (n = 14,545) in the UK, Osborn et al. (2002) found that about 25% of the sample scored less than 1 on the GDS-15.</p>
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>	<p>Mossey et al. (1996) McCurren et al. (1999) Llewellyn-Jones et al. (1999) Sumaya et al. (2001) Vinkers et al. (2004b) Olazarab et al. (2004) Sparks et al. (2005)</p>	<p>X Hypotheses were formulated and results were in agreement</p> <p><input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard)</p> <p><input type="checkbox"/> No information on sensitivity to change was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful</p> <p>X MCID – No information was provided.</p>	<p>Clinical studies showing a change in scores on the GDS following treatment include:</p> <p>Interpersonal counselling therapy for subdysthymic depression in the medically ill (Mossey et al., 1996).</p> <p>Cognitive exercises for one year in mild cognitive impairment / Alzheimer's Disease treated with cholinesterase inhibitor (ChEI) (Olazarab et al., 2004).</p> <p>Treatment with Atorvastatin calcium for one year (Sparkset al., 2005).</p> <p>Bright light treatment in residential care (Sumaya et al., 2001).</p> <p>Geropsychiatric nurse and trained volunteers for depressed elders in nursing homes (McCurren et al., 1999).</p> <p>Multi-disciplinary, shared care intervention for depressed elders in nursing home (plus education and activity programs) (Llewellyn-Jones et al., 1999).</p> <p>See also Vinkers et al. (2004b) which showed a change in score in relation to the loss of a life partner (negative life event).</p>

			MCID information needs to be further investigated.
--	--	--	--

Cultural Applicability

and Cultural Adaptations:

There are numerous language versions including Chinese, Italian, Turkish, Vietnamese and Spanish. For a full list see the PROQOLID database. (Though users are advised to check for accuracy of translation - Bowling 2005; GDS web-site).

Gender Appropriateness:

The GDS is appropriate for use with both genders. As is common with most depression questionnaires women score higher than men (Osborn et al., 2002) and separate cut scores may be appropriate (Allen-Burge et al., 1994).

Age Appropriateness:

The GDS is appropriate for adults over 55 years (Source: PROQOLID). McDowell (2006) suggests that there are some issues using the instrument with those seventy five years and over, for example, the GDS does not look at the two week persistence of symptoms of depression.

Summary:

A widely used and researched, self-report instrument for the assessment and screening of depression in elderly people. The GDS compares favourably with other rating scales and self report measures of depression, for example, Hamilton Rating Scale for Depression (HRSD) and the CES-D; while being easier to administer and complete for elderly people (McDowell, 2006). The GDS has been used in hospital, community / primary care and residential settings (Bowling, 2005), and has good psychometric properties. However, care is needed when interpreting data from the GDS-15 obtained from community and hospital samples, as there is some evidence of lower reliability for this version of the scale outside of residential care settings.

In terms of psychometric development, further research work is needed in the following areas: (1) the issue of detecting minor depression with the GDS (Watson and Pigone, 2003); (2) the use of the GDS for those that are 75 years and older (McDowell, 2006); and (3) the applicability and suitability of the GDS for those with dementia / cognitive impairment. Here the evidence is mixed at best, and restricts the applicability of this instrument to those with milder forms of dementia - though it must be remembered that this scale was not specifically designed for people with dementia.

In terms of research design, future research studies should acknowledge the methodological issue of whether the blinding of research workers is operating when they use the GDS (Wacanta et al., 2006).

Finally, McDowell (2006) provides an important clinical recommendation which is applicable to all psychiatric measures, namely that a psychiatric interview is required to confirm any classification.

Reporter:

Nicholas Marosszeky

Date of report:

August 2007

References

- Abraham IL (1991) *The Geriatric Depression Scale and Hopelessness Index: longitudinal psychometric data on frail nursing home residents*. Perceptual and Motor Skills. Vol. 72, No.3, Pt.1, pp.875-880.
- Adams KB (2001) *Depressive symptoms, depletion, or developmental change? Withdrawal, apathy, and lack of vigor in the Geriatric Depression Scale*. Gerontologist. Vol. 41, No.6, pp.768-777.
- Adams KB, Matto HC and Sanders S (2004) *Confirmatory factor analysis of the geriatric depression scale*. Gerontologist. Vol. 44, No.6, pp.818-826.
- Aikman GG and Oehlert ME (2001) *Geriatric Depression Scale: long form versus short form*. Clinical Gerontologist. Vol. 22, No.3/4, pp.63-70.
- Alden D, Austin C and Sturgeon R (1989) *A correlation between the Geriatric Depression Scale long and short forms*. Journal of Gerontology. Vol. 44, No.4, pp.124-125.
- Almagro P, Calbo E, Ochoa de Echaguen A, et al. (2002) *Mortality after hospitalization for COPD*. Chest. Vol. 121, No.5, pp.1441-1448.
- Almeida OP and Almeida SA (1999) *Short versions of the geriatric depression scale: a study of their validity for the diagnosis of a major depressive episode according to ICD-10 and DSM-IV*. International Journal of Geriatric Psychiatry. Vol. 14, No.10, pp.858-865.
- Arthur A, Jagger C, Lindesay J, et al. (1999) *Using an annual over-75 health check to screen for depression: validation of the short Geriatric Depression Scale (GDS15) within general practice*. International Journal of Geriatric Psychiatry. Vol. 14, No.6, pp.431-439.
- Bagley H, Cordingley L, Burns A, et al. (2000) *Recognition of depression by staff in nursing and residential homes*. Journal of Clinical Nursing. Vol. 9, No.3, pp.445-450.
- Barbisoni P, Bertozzi B, Franzoni S, et al. (1996) *Mood improvement in elderly women after in-hospital physical rehabilitation*. Archives of Physical Medicine and Rehabilitation. Vol. 77, No.4, pp.346-349.
- Bedard M, Molloy DW, Squire L, et al. (2003) *Validity of self-reports in dementia research: the Geriatric Depression Scale*. Clinical Gerontologist. Vol. 26, No.3/4, pp.155-163.
- Bijl D, van Marwijk HWJ, Ader HJ, et al. (2005) *Test-characteristics of the GDS-15 in screening for major depression in elderly patients in general practice*. Clinical Gerontologist. Vol. 29, No.1, pp.1-9.
- Bishop KL, Ferraro FR and Borowiak DM (2001) *Pain management in older adults: role of fear and avoidance*. Clinical Gerontologist. Vol. 23, No.1/2, pp.33-42.
- Blank K, Gruman C and Robison JT (2004) *Case-finding for depression in elderly people: balancing ease of administration with validity in varied treatment settings*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 59, No.4, pp.378-384.
- Bolla-Wilson K and Bleecker ML (1989) *Absence of depression in elderly adults*. Journal of Gerontology. Vol. 44, No.2, pp.P53-55.
- Bowling A (2005) *Measuring health: A review of quality of life measurement scales*. Open University Press, Berkshire, England.
- Brown LM and Schinka JA (2005) *Development and initial validation of a 15-item informant version of the Geriatric Depression Scale*. International Journal of Geriatric Psychiatry. Vol. 20, No.10, pp.911-918.
- Brink TL, Yesavage JA, Lum O, et al. (1982) *Screening tests for geriatric depression*. Clinical Gerontologist. Vol. 1, No.1, pp.37-43.
- Brink TL and Niemeyer L (1992) *Assessment of depression in college students: Geriatric Depression Scale versus Center for Epidemiological Studies Depression Scale*. Psychological Reports. Vol. 71, No.1, pp.163-166.

Burke WJ, Houston MJ, Boust SJ, et al. (1989) *Use of the Geriatric Depression Scale in dementia of the Alzheimer type*. Journal of the American Geriatrics Society. Vol. 37, No.9, pp.856-860.

Burke WJ, Roccaforte WH and Wengel SP (1991) *The short form of the Geriatric Depression Scale: a comparison with the 30-item form*. Journal of Geriatric Psychiatry and Neurology. Vol. 4, No.3, pp.173-178.

Burke WJ, Nitcher RL, Roccaforte WH, et al. (1992) *A prospective evaluation of the Geriatric Depression Scale in an outpatient geriatric assessment center*. Journal of the American Geriatrics Society. Vol. 40, No.12, pp.1227-1230.

Burns A, Lawlor B., Craig S (2004) *Assessment scales in old age psychiatry*. Taylor & Francis, London.

Cannon BJ, Thaler T and Roos S (2002) *Oral versus written administration of the Geriatric Depression Scale*. Aging and Mental Health. Vol. 6, No.4, pp.418-422.

Carlson LE, Sherwin BB and Chertkow HM (2000) *Relationships between mood and estradiol (E2) levels in Alzheimer's disease (AD) patients*. Journals of Gerontology Series B: Psychological Sciences and Social Sciences. Vol. 55, No.1, pp.P47-53.

Chen H, Cantor A, Meyer J, et al. (2003) *Can older cancer patients tolerate chemotherapy? A prospective pilot study*. Cancer. Vol. 97, No.4, pp.1107-1114.

Clayton AH, Holroyd S and Sheldon-Keller A (1997) *Geriatric Depression Scale vs. Hamilton Rating Scale for Depression in a sample of anxiety patients*. Clinical Gerontologist. Vol. 17, No.3, pp.3-13.

Coleman PG, Philp I and Mullee MA (1995) *Does the use of the Geriatric Depression Scale make redundant the need for separate measures of well-being on geriatrics wards?* Age and Ageing. Vol. 24, No.5, pp.416-420.

Collins MW and Abeles N (1996) *Subjective memory complaints and depression in the able elderly*. Clinical Gerontologist. Vol. 16, No.4, pp.29-54.

Costa E, Barreto SM, Uchoa E, et al. (2003) *Agreement between the Geriatric Depression Scale and the General Health Questionnaire in a population-based elderly cohort: the Bambui Health & Ageing Study (BHAS)*. Clinical Gerontologist. Vol. 26, No.3/4, pp.69-82.

Crane PB (2005) *Fatigue and physical activity in older women after myocardial infarction*. Heart and Lung. Vol. 34, No.1, pp.30-38.

Cuijpers P and Van Lammeren P (1999) *Depressive symptoms in chronically ill elderly people in residential homes*. Aging and Mental Health. Vol. 3, No.3, pp.221-226.

Cully JA, Gfeller JD, Heise RA, et al. (2005a) *Geriatric depression, medical diagnosis, and functional recovery during acute rehabilitation*. Archives of Physical Medicine and Rehabilitation. Vol. 86, No.12, pp.2256-2260.

Cully, JA, Graham DP and Kramer JR (2005b) *A 2-item screen for depression in rehabilitation inpatients*. Archives of Physical Medicine and Rehabilitation. Vol. 86, No.3, pp.469-472.

Daaleman TP, Frey BB, Wallace D, et al. (2002) *Spirituality Index of Well-Being Scale: development and testing of a new measure*. Journal of Family Practice. Vol. 51, No.11, pp.952.

D'Ath P, Katona P, Mullan E, et al. (1994) *Screening, detection and management of depression in elderly primary care attenders. I: The acceptability and performance of the 15 item Geriatric Depression Scale (GDS15) and the development of short versions*. Family Practice. Vol. 11, No.3, pp.260-266.

de Craen AJ, Heeren TJ and Gussekloo J (2003) *Accuracy of the 15-item geriatric depression scale (GDS-15) in a community sample of the oldest old*. International Journal of Geriatric Psychiatry. Vol. 18, No.1, pp.63-66.

Diamond PT, Holroyd S, Macciocchi SN, et al. (1995) *Prevalence of depression and outcome on the geriatric rehabilitation unit*. American Journal of Physical Medicine and Rehabilitation. Vol. 74, No.3, pp.214-217.

Dunn VK and Sacco WP (1988) *Effect of instructional set on responses to the Geriatric Depression Scale*. Psychology and Aging. Vol. 3, No.3, pp.315-316.

Dunn VK and Sacco WP (1989) *Psychometric evaluation of the Geriatric Depression Scale and the Zung Self-Rating Depression Scale using an elderly community sample*. Psychology and Aging. Vol. 4, No.1, pp.125-126.

Edelberg HK, Shallenberger E, Hausdorff JM, et al. (2000) *One-year follow-up of medication management capacity in highly functioning older adults*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 55, No.10, pp.M550-553.

Ertan FS, Ertan T, Kiziltan G, et al. (2005) *Reliability and validity of the Geriatric Depression Scale in depression in Parkinson's disease*. Journal of Neurology, Neurosurgery and Psychiatry. Vol. 76, No.10, pp.1445-1447.

Feher EP, Larrabee GJ and Crook TH (1992) *Factors attenuating the validity of the Geriatric Depression Scale in a dementia population*. Journal of the American Geriatrics Society. Vol. 40, No.9, pp.906-909.

Ferraro FR (2003) *Psychological resilience in older adults following the 1997 flood*. Clinical Gerontologist. Vol. 26, No.3/4, pp.139-143.

Ferraro FR and Chelminski I (1996) *Preliminary normative data on the Geriatric Depression Scale-Short Form (GDS-SF) in a young adult sample*. Journal of Clinical Psychology. Vol. 52, No.4, pp.443-447.

Fischer LR, Rolnick SJ, Jackson J, et al. (1996) *The Geriatric Depression Scale: a content analysis of respondent comments*. Journal of Mental Health and Aging. Vol. 2, No.2, pp.125-135.

Friedman B, Heisel MJ and Delavan RL (2005) *Psychometric properties of the 15-item geriatric depression scale in functionally impaired, cognitively intact, community-dwelling elderly primary care patients*. Journal of the American Geriatrics Society. Vol. 53, No.9, pp.1570-1576.

Galaria II, Casten RJ and Rovner BW (2000) *Development of a shorter version of the geriatric depression scale for visually impaired older patients*. International Psychogeriatrics. Vol. 12, No.4, pp.435-443.

Garrard J, Rolnick SJ, Nitz NM, et al. (1998) *Clinical detection of depression among community-based elderly people with self-reported symptoms of depression*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol.53, No.2, pp.M92-101.

Gazmararian J, Baker D, Parker R, et al. (2000) *A multivariate analysis of factors associated with depression: evaluating the role of health literacy as a potential contributor*. Archives of Internal Medicine. Vol. 160, No.21, pp.3307-3314.

Gilley DW and Wilson RS (1997) *Criterion-related validity of the Geriatric Depression Scale in Alzheimer's disease*. Journal of Clinical and Experimental Neuropsychology: Official Journal of the International Neuropsychological Society. Vol. 19, No.4, pp.489-499.

Harper RG, Kotik-Harper D and Kirby H (1990) *Psychometric assessment of depression in an elderly general medical population: Over- or underassessment?* Journal of Nervous and Mental Disease. Vol. 178, No.2, pp.113-119.

Heisel MJ, Flett GL, Duberstein PR, et al. (2005) *Does the geriatric depression scale (GDS) distinguish between older adults with high versus low levels of suicidal ideation?* American Journal of Geriatric Psychiatry. Vol. 13, No.10, pp.876-883.

Hoyl MT, Alessi CA, Harker JO, et al. (1999) *Development and testing of a five-item version of the Geriatric Depression Scale*. Journal of the American Geriatrics Society. Vol. 47, No.7, pp.873-878.

Incalzi RA, Cesari M, Pedone C, et al. (2003) *Construct validity of the 15-item geriatric depression scale in older medical inpatients*. Journal of Geriatric Psychiatry and Neurology. Vol. 16, No.1, pp.23-28.

Ingles JL, Eskes GA and Phillips SJ (1999) *Fatigue after stroke*. Archives of Physical Medicine and Rehabilitation. Vol. 80, No.2, pp.173-178.

Ingram F (1996) *The Short Geriatric Depression Scale: a comparison with the standard form in independent older adults*. Clinical Gerontologist. Vol. 16, No.3, pp.49-56.

Iglesias GH (2004) *Geriatric Depression Scale Short Form and Zung Self-Rating Depression Scale: a study of homebound elders*. Clinical Gerontologist. Vol. 27, No.3, pp.55-66.

Jackson R and Baldwin B (1993) *Detecting depression in elderly medically ill patients: the use of the Geriatric Depression Scale compared with medical and nursing observations*. Age and Ageing. Vol. 22, No.5, pp.349-353.

Jackson JC, Hart RP, Gordon SM, et al. (2003) *Six-month neuropsychological outcome of medical intensive care unit patients*. Critical Care Medicine. Vol. 31, No.4, pp.1226-1234.

Jefferson AL, Powers DV and Pope M (2001) *Beck Depression Inventory-II (BDI-II) and the Geriatric Depression Scale (GDS) in older women*. Clinical Gerontologist. Vol. 22, No.3/4, pp.3-12.

Jongenelis K, Pot AM, Eisses AM, et al. (2005) *Diagnostic accuracy of the original 30-item and shortened versions of the Geriatric Depression Scale in nursing home patients*. International Journal of Geriatric Psychiatry. Vol. 20, No.11, pp.1067-1074.

Kafonek S, Ettinger WH, Roca R, et al. (1989) *Instruments for screening for depression and dementia in a long term care facility*. JAGS. Vol. 37, pp. 29-34.

Katz PP and Yelin EH (1995) *The development of depressive symptoms among women with rheumatoid arthritis: The role of function*. Arthritis and Rheumatism. Vol. 38, No.1, pp.49-56.

Kemp BJ, Adams BM and Campbell ML (1997) *Depression and life satisfaction in aging polio survivors versus age-matched controls: relation to post-polio syndrome, family functioning, and attitude toward disability*. Archives of Physical Medicine and Rehabilitation. Vol. 78, No.2, pp.187-192.

Kenny AM, Fabregas G, Song C, et al. (2004) *Effects of testosterone on behavior, depression, and cognitive function in older men with mild cognitive loss*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 59, No.1, pp.75-78.

Kerber CS, Dyck MJ, Culp K, et al. (2005) *Comparing the Geriatric Depression Scale, Minimum Data Set, and primary care provider diagnosis for depression in rural nursing home residents*. Journal of the American Psychiatric Nurses Association. Vol. 11, No.5, pp.269-275.

Klaas D (1998) *Testing two elements of spirituality in depressed and non-depressed elders*. International Journal of Psychiatric Nursing Research. Vol. 4, No.2, pp.452-462.

Koenig HG, Cohen HJ, Blazer DG, et al. (1992) *Religious coping and depression among elderly, hospitalized medically ill men*. American Journal of Psychiatry. Vol. 149, No.12, pp.1693-1700.

Krichbaum K, Ryden M, Snyder M, et al. (1999) *The impact of transition to nursing home on elders' cognitive status, well-being, and satisfaction with nursing home*. Journal of Mental Health and Aging. Vol. 5, No.2, pp.135-150.

Korner A, Lauritzen L, Abelskov K, et al. (2006) *The Geriatric Depression Scale and the Cornell Scale for Depression in Dementia. A validity study*. Nord J Psychiatry. Vol. 60; pp. 360-364.

Kurlowicz LH (1998) *Perceived self-efficacy, functional ability, and depressive symptoms in older elective surgery patients*. Nursing Research. Vol. 47, No.4, pp.219-226.

Kwok T, Lo RS, Wong E, et al. (2006) *Quality of life of stroke survivors: a 1-year follow-up study*. Archives of Physical Medicine and Rehabilitation. Vol. 87, No.9, pp.1177-1182.

Lee M and Ganzini L (1994) *The effect of recovery from depression on preferences for life-sustaining therapy in older patients*. Journal of Gerontology. Vol. 49, No.1, pp.M15-21.

Leshner EL and Berryhill JS (1994) *Validation of the Geriatric Depression Scale - Short Form among inpatients*. Journal of Clinical Psychology. Vol. 50, No.2, pp.256-260.

- Leung JM, Sands LP, Mullen EA, et al. (2005) *Are preoperative depressive symptoms associated with postoperative delirium in geriatric surgical patients?* Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol.60, No.12, pp.1563-1568.
- Liao S and Ferrell BA (2000) *Fatigue in an older population*. Journal of the American Geriatrics Society. Vol. 48, No.4, pp.426-430.
- Lichtenberg PA, Marcopulos BA, Steiner DA, et al. (1992) *Comparison of the Hamilton Depression Rating Scale and the Geriatric Depression Scale: detection of depression in dementia patients*. Psychological Reports Vol. 70, No.2, pp.515-521.
- Lichtenberg PA, Ross T, Millis SR, et al. (1995) *The relationship between depression and cognition in older adults: a cross-validation study*. Journals of Gerontology Series B: Psychological Sciences and Social Sciences. Vol. 50, No.1, pp.P25-P32.
- Levy-Cushman J and Abeles N (1998) *Memory complaints in the able elderly*. Clinical Gerontologist. Vol. 19, No.2, pp.3-24.
- Llewellyn-Jones RH, Baikie KA, Smithers H, et al. (1999) *Multi-faceted shared care intervention for late life depression in residential care: randomised controlled trial*. British Medical Journal. Vol. 319, No.7211, pp.676-682.
- Lyness JM, Noel TK, Cox C, et al. (1997) *Screening for depression in elderly primary care patients. A comparison of the Center for Epidemiologic Studies-Depression Scale and the Geriatric Depression Scale*. Archives of Internal Medicine. Vol. 157, No.4, pp.449-454.
- Lyons JS, Strain JJ, Hammer JS, et al. (1989) *Reliability, validity, and temporal stability of the geriatric depression scale in hospitalized elderly*. International Journal of Psychiatry in Medicine. Vol. 19, No.2, pp.203-209.
- Mallik S, Krumholz HM, Lin Z, et al. (2005) *Patients with depressive symptoms have lower health status benefits after coronary artery bypass surgery*. Circulation. Vol. 111, No.3, pp.271-277.
- Massman PJ, Kreiter KT, Jankovic J, et al. (1996) *Neuropsychological functioning in cortical-basal ganglionic degeneration: Differentiation from Alzheimer's disease*. Neurology. Vol. 46, No.3, pp.720-726.
- Mast BT, MacNeill SE and Lichtenberg PA (1999) *Geropsychological problems in medical rehabilitation: dementia and depression among stroke and lower extremity fracture patients*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 54, No.12, pp.M607-12.
- Mast BT, Yochim B, MacNeill SE, et al. (2004) *Risk factors for geriatric depression: the importance of executive functioning within the vascular depression hypothesis*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 59, No.12, pp.1290-1294.
- McCurren C, Dowe D, Rattle D, et al. (1999) *Depression among nursing home elders: testing an intervention strategy*. Applied Nursing Research. Vol. 12, No.4, pp.185-195.
- McDonald WM, Holtzheimer PE, Haber M, et al. (2006) *Validity of the 30-item geriatric depression scale in patients with Parkinson's disease*. Movement Disorders. Vol. 21, No.10, pp.1618-1622.
- McDowell I (2006) *Measuring health: A guide to rating scales and questionnaires*. Oxford University Press, Oxford.
- Meara J, Mitchelmore E and Hobson P (1999) *Use of the GDS-15 geriatric depression scale as a screening instrument for depressive symptomatology in patients with Parkinson's disease and their carers in the community*. Age and Ageing. Vol. 28, No.1, pp.35-38.
- Meeks S (2004) *Further evaluation of the MDS Depression Scale versus the Geriatric Depression Scale among nursing home residents*. Journal of Mental Health and Aging. Vol. 10, No.4, pp.325-335.

- Mittelman MS, Roth DL, Coon DW, et al. (2004) *Sustained benefit of supportive intervention for depressive symptoms in caregivers of patients with Alzheimer's disease*. American Journal of Psychiatry. Vol. 161, No.5, pp.850-856.
- Mondolo F, Jahanshahi M, Grana A, et al. (2006) *The validity of the hospital anxiety and depression scale and the geriatric depression scale in Parkinson's disease*. Behavioural Neurology. Vol. 17, No.2, pp.109-115.
- Montorio I and Izal M (1996) *The Geriatric Depression Scale: a review of its development and utility*. International Psychogeriatrics. Vol. 8, No.1, pp.103-112.
- Mossey JM, Knott KA, Higgins M, et al. (1996) *Effectiveness of a psychosocial intervention, interpersonal counseling, for subdysthymic depression in medically ill elderly*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 51, No.4, pp.M172-8.
- Nebes RD, Vora IJ, Meltzer CC, et al. (2001) *Relationship of deep white matter hyperintensities and apolipoprotein E genotype to depressive symptoms in older adults without clinical depression*. American Journal of Psychiatry. Vol. 158, No.6, pp.878-884.
- Nir Z, Zolotogorsky Z and Sugarman H (2004) *Structured nursing intervention versus routine rehabilitation after stroke*. American Journal of Physical Medicine and Rehabilitation. Vol. 83, No.7, pp.522-529.
- Norris MP and Woehr MD (1998) *Differentiating somatic symptoms in the elderly: depression, aging, or illness?* Journal of Mental Health and Aging. Vol. 4, No.3, pp.347-359.
- Olazaran J, Muniz R, Reisberg B, et al. (2004) *Benefits of cognitive-motor intervention in MCI and mild to moderate Alzheimer disease*. Neurology. Vol. 63, No.12, pp.2348-2353.
- Olin JT, Schneider LS, Eaton EM, et al. (1992) *The Geriatric Depression Scale and the Beck Depression Inventory as screening instruments in an older adult outpatient population*. Psychological Assessment. Vol. 4, No.2, pp.190-192.
- Onder G, Penninx B, Landi F, et al. (2003) *Depression and adverse drug reactions among hospitalized older adults*. Archives of Internal Medicine. Vol. 163, No.3, pp.301-305.
- Onishi J, Suzuki Y, Umegaki H, et al. (2006) *A comparison of depressive mood of older adults in a community, nursing homes, and a geriatric hospital: factor analysis of Geriatric Depression Scale*. Journal of Geriatric Psychiatry and Neurology. Vol. 19, No.1, pp. 26-31.
- O'Riordan TG, Hayes JP, O'Neill D, et al. (1990) *The effect of mild to moderate dementia on the Geriatric Depression Scale and on the General Health Questionnaire*. Age and Ageing. Vol. 19, No.1, pp.57-61.
- Osborn DPJ, Fletcher AE, Smeeth L, et al. (2002) *Geriatric Depression Scale Scores in a representative sample of 14 545 people aged 75 and over in the United Kingdom: results from the MRC Trial of Assessment and Management of Older People in the Community*. International Journal of Geriatric Psychiatry. Vol. 17, No.4, pp.375-382.
- Parmelee PA, Lawton MP and Katz IR (1989) *Psychometric properties of the Geriatric Depression Scale among the institutionalized aged*. Psychological Assessment. Vol.1, No. 4, pp.331-338.
- Parmelee PA, Katz IR and Lawton MP (1991a) *The relation of pain to depression among institutionalized aged*. Journal of Gerontology. Vol. 46, No.1, pp.P15-21.
- Parmelee PA, Kleban MH, Lawton MP, et al. (1991b) *Depression and cognitive change among institutionalized aged*. Psychology and Aging. Vol.6, No. 4, pp.504-511.
- Peach J, Koob JJ and Kraus MJ (2001) *Psychometric evaluation of the Geriatric Depression Scale (GDS): supporting its use in health care settings*. Clinical Gerontologist. Vol. 23, No.3/4, pp.57-68.
- Penninx BWJH, Guralnik JM, Ferrucci L, et al. (2000) *Vitamin B (12) deficiency and depression in physically disabled older women: epidemiologic evidence from the Women's Health and Aging Study*. American Journal of Psychiatry. Vol. 157, No.5, pp.715-721.

Pond CD, Mant A, Bridges-Webb C, et al. (1990) *Recognition of depression in the elderly: a comparison of general practitioner opinions and the Geriatric Depression Scale*. Family Practice. Vol. 7, No.3, pp.190-194.

Rankin EJ, Gfeller JD and Gilner FH (1993) *Measuring anxiety states in the elderly using the State-trait Anxiety Inventory for Children*. Journal of Psychiatric Research. Vol. 27, No.1, pp.111-7.

Rapp SR, Parisi SA, Walsh DA, et al. (1988) *Detecting depression in elderly medical inpatients*. Journal of Consulting and Clinical Psychology. Vol. 56, No.4, pp.509-513.

Rinaldi P, Mecocci P, Benedetti C, et al. (2003) *Validation of the five-item geriatric depression scale in elderly subjects in three different settings*. Journal of the American Geriatrics Society. Vol. 51, No.5, pp.694-698.

Ruchinskas R (2002) *Rehabilitation therapists' recognition of cognitive and mood disorders in geriatric patients*. Archives of Physical Medicine and Rehabilitation. Vol. 83, No.5, pp.609-612.

Salamero M and Marcos T (1992) *Factor study of the Geriatric Depression Scale*. Acta Psychiatrica Scandinavica. Vol. 86, No.4, pp.283-286.

Schuler M, Njoo N, Hestermann M, et al. (2004) *Acute and chronic pain in geriatrics: clinical characteristics of pain and the influence of cognition*. Pain Medicine. Vol. 5, No.3, pp.253-262.

Segal DL, Hersen M, Kabacoff RI, et al. (1998) *Personality disorders and depression in community-dwelling older adults*." Journal of Mental Health and Aging. Vol. 4, No.1, pp.171-182.

Segulin N and Deponte A (2007) *The evaluation of depression in the elderly: a modification of the Geriatric Depression Scale (GDS)*. Archives of Gerontology and Geriatrics. Vol. 44, No.2, pp.105-112.

Sheikh JI and Yesavage JA (1986) *Geriatric Depression Scale (GDS): Recent evidence and development of a shorter version*. Clinical Gerontologist. Vol. 5, No.1-2, Jun 1986, pp.165-173.

Sheikh JI, Yesavage JA, Brooks JO, et al. (1991) *Proposed factor structure of the Geriatric Depression Scale*. International Psychogeriatrics. Vol. 3, No.1, pp.23-28.

Shah A, Herbert R, Lewis S, et al. (1997) *Screening for depression among acutely ill geriatric inpatients with a short Geriatric Depression Scale*. Age and Ageing. Vol. 26, No.3, pp.217-221.

Shmueli-Dulitzki Y and Rovner BW (1997) *Screening for depression in older persons with low vision. Somatic eye symptoms and the Geriatric Depression Scale*. American Journal of Geriatric Psychiatry. Vol. 5, No.3, pp.216-220.

Shua-Haim JR, Haim T, Shi Y, et al. (2001) *Depression among Alzheimer's caregivers: identifying risk factors*." American Journal of Alzheimer's Disease and Other Dementias. Vol. 16, No.6, pp.353-359.

Snowdon J and Lane F (1999) *Use of the Geriatric Depression Scale by nurses*. Aging and Mental Health. Vol. 3, No.3, pp.227-33.

Sood JR, Cisek E, Zimmerman J, et al. (2003) *Treatment of depressive symptoms during short-term rehabilitation: An attempted replication of the DOUR project*. Rehabilitation Psychology. Vol. 48, No.1, pp.44-49.

Soref E and DeVries HM (2005) *Evaluation of a partial hospitalization mental health program for older adults*. Clinical Gerontologist. Vol. 28, No.3, pp.27-44.

Sparks DL, Sabbagh MN, Connor DJ, et al. (2005) *Atorvastatin for the treatment of mild to moderate Alzheimer disease: preliminary results*. Archives of Neurology. Vol. 62, No.5, pp.753-757.

Storandt M (2005) *Use of the 5-item Geriatric Depression Scale in demented individuals and with psychiatric outpatients*. Clinical Gerontologist. Vol. 28, No.3, pp.63-69.

Sumaya IC, Rienzi BM, Deegan JF, et al. (2001) *Bright light treatment decreases depression in institutionalized older adults: a placebo-controlled crossover study*. Journals of Gerontology Series A: Biological Sciences and Medical Sciences. Vol. 56, No.6, pp.M356-60.

Sutcliffe C, Cordingley L, Burns A, et al. (2000) *A new version of the geriatric depression scale for nursing and residential home populations: the geriatric depression scale (residential) (GDS-12R)*. International Psychogeriatrics. Vol. 12, No.2, pp.173-181.

Tang WK, Wong E, Chiu HF, et al. (2005) *The Geriatric Depression Scale should be shortened: results of Rasch analysis*. International Journal of Geriatric Psychiatry. Vol. 20, No.8, pp.783-789.

Vaccarino V, Kasl SV, Abramson J, et al. (2001) *Depressive symptoms and risk of functional decline and death in patients with heart failure*. Journal of the American College of Cardiology. Vol. 38, No.1, pp.199-205.

van Marwijk HW, Wallace P, de Bock GH, et al. (1995) *Evaluation of the feasibility, reliability and diagnostic value of shortened versions of the geriatric depression scale*. British Journal of General Practice. Vol. 45, No.393, pp.195-199.

Vinkers DJ, Gussekloo J, Stek ML, et al. (2004a) *Temporal relation between depression and cognitive impairment in old age: prospective population based study*. British Medical Journal. Vol. 329, No.7471, pp.881.

Vinkers DJ, Gussekloo J, Stek ML, et al. (2004b) *The 15-item Geriatric Depression Scale (GDS-15) detects changes in depressive symptoms after a major negative life event: The Leiden 85-plus Study*. International Journal of Geriatric Psychiatry. Vol. 19, No.1, pp.80-84.

Vinkers DJ, Stek ML, van der Mast RC, et al. (2005) *Generalized atherosclerosis, cognitive decline, and depressive symptoms in old age*. Neurology. Vol. 65, No.1, pp.107-112.

Wall JR, Lichtenberg PA, MacNeill SE, et al. (1999) *Depression detection in geriatric rehabilitation: Geriatric Depression Scale short form vs. long form*. Clinical Gerontologist. Vol. 20, No.3, pp.13-21.

Wancata J, Alexandrowicz R, Marquart B, et al. (2006) *The criterion validity of the Geriatric Depression Scale: a systematic review*. Acta Psychiatrica Scandinavica. Vol. 114, No.6, pp.398-410.

Watson LC and Pignone MP (2003) *Screening accuracy for late-life depression in primary care: a systematic review*. Journal of Family Practice. Vol. 52, No.12, pp.956-964.

Weintraub D, Oehlberg KA, Katz IR, et al. (2006) *Test characteristics of the 15-item geriatric depression scale and Hamilton depression rating scale in Parkinson disease*. American Journal of Geriatric Psychiatry. Vol. 14, No.2, pp.169-175.

Zalon ML (2004) *Correlates of recovery among older adults after major abdominal surgery*. Nursing Research. Vol. 53, No.2, pp.99-106.

The PROQOLID Database (of the MAPI Research Trust in France) was used as an additional source of information for this review (Web-site: <http://www.proqolid.org/>).

Cornell Scale for Depression in Dementia

Note: This review from the Dementia Outcomes Measurement Suite project is reprinted with the permission of the authors (Sansoni et al., 2008).

Title:	Cornell Scale for Depression in Dementia or Cornell Scale for Depression.
Abbreviations:	CSDD, CSD.
Author(s) Name:	George S. Alexopoulos, M.D.
Author(s) Address:	George S. Alexopoulos, M.D. Professor of Psychiatry Weill-Cornell Institute of Geriatric Psychiatry Weill Medical College of Cornell University 21 Bloomingdale Road White Plains, NY 10605. http://www.med.cornell.edu/research/galexopoulos/
Supplied by:	Copies of the CSDD are widely available in print and on the internet. See the following web-sites: http://www.health.gov.au/internet/wcms/publishing.nsf/Content/6B8B6CC632385F5BCA2571EA0018ECF6/\$File/ACFI%20Assessments%20(2007-02-07).pdf http://www.health.gov.au/internet/wcms/publishing.nsf/Content/ageing-rescare-natframe.htm~ageing-rescare-natframe08.htm
Cost:	Need to seek permission to use from Dr Alexopoulos or Elsevier Science. http://www.elsevier.com/wps/find/supportfaq.cws_home/permissionusematerial
Training requirements:	Users need to be familiar with the administration and scoring guidelines. Web-site: http://www.health.gov.au/internet/wcms/publishing.nsf/Content/ageing-rescare-natframe.htm~ageing-rescare-natframe08.htm Training is to be provided as part of the ACFI process. See the following web-site: http://www.health.gov.au/internet/wcms/publishing.nsf/Content/ageing-acfi-trainingprogram.htm Little information is available in the scientific literature on the training of users of the CSDD.
Purpose:	Focuses on the Identification of depressive symptoms and signs in patients with Alzheimer's Disease and other Dementias (McKeith et al., 1999).
Administration time:	20 minutes (Administration and scoring guidelines) - 30 minutes (20 minutes with carer and 10 minutes with the patient) (Burns et al., 2004).
Instrument Type:	Clinical Rating Scale based on an interview. The clinical rating is based on semi structured interviews questions with informant and interview questions and signs from the patient.

If discrepancies emerge you should re-interview (Administration and Scoring Guidelines).

The timeframe for the symptom ratings is for the previous week.

The Informant can include nursing staff or a relative. However, they must have frequent contact with the patient (refer Administration and Scoring Guidelines).

Structure:	19 item scale. Items grouped under the following headings – Mood Related Signs; Behavioural Disturbance, Physical Signs, Cyclic Functions, Ideational Disturbance.
Scoring:	Items are added to give a total score. Item response format: absent, mild or intermittent and severe; plus unable to evaluate. (Scoring 0 – 2).
Developed for:	To develop a more suitable method to assess major depression symptoms in dementia patients by obtaining information from the patient and an informant (Alexopoulos et al., 1988a).
Normative Data:	No normative information for the CSDD was found. A score of 10 or more indicates a probable major depression. Scores above 18 indicate a definite major depression (Source: Administration and scoring guidelines). Papers by Watson et al. (2003) and Watson et al. (2006) set the cut score at 7 or more for residents in assisted living facilities.
Clinical Data:	Numerous clinical studies were found, including treatment studies and clinical research into depression and dementia.

Disease groups:

- Chronic obstructive pulmonary disease (COPD): Ozge et al. (2006).
- Parkinson's disease: Herrmann et al. (1997).
- Stroke: Beblo and Driessen (2002), Schreiner and Morimoto (2002), Schottke et al. (2001), Herrmann et al. (1997), Herrmann et al. (1995).

Treatment studies:

- Bright light therapy in dementia: Lyketsos et al. (1999a).
- Buddy program (natural helping network): Cohen et al. (1999).
- Case management vs. consultation in nursing home / use of psychogeriatric team: Brodaty et al. (2003).
- Collaborative care in primary care / interdisciplinary team led by a nurse practitioner / assessment guidelines and standard treatment / behavioural approaches – Callahan et al. (2006).
- Exercise training and behavioural management training for caregivers: Teri et al. (2003).
- Group psychotherapy for anxiety and depression in mild and moderate dementia; Cheston et al. (2003).
- Maintaining social relationships in patients with AD via a day care centre: Vespa et al. (2002).
- Music Therapy: Ashida (2000)
- Sleep hygiene education, daily walking and increased light exposure treatment (NITE-AD): McCurry et al. (2005)
- Snoezelen or controlled multisensory stimulation in residential care: van Weert et al. (2005)

Drug Treatments:

- Anti-depressants for treating depression in dementia (Cochrane Review): Bains et al. (2007)
- Estrogen skin patch for aggressive behaviour in male patients with AD: Hall et al. (2005).

- Sertraline treatment for depression in AD: Lyketsos et al. (2000), Steinberg et al. (2004), Magai et al. (2000), Lyketsos et al. (2003).
- Use of Risperidone in the treatment of VD or mixed dementia: Cruz-Jentoft et al. (2005).
- Low doses L-deprenyl treatment in AD: Schneider et al. (1991).
- Cerebrolysin treatment in AD: Panisset et al. (2002).
- Mirtazapine (oral) treatment in nursing home: Roose et al. (2003), Nelson et al. (2006).
- Rivastigmine treatment in VD: Moretti et al. (2002)
- Rivastigmine in frontotemporal dementia: Moretti et al. (2004).

Clinical Insights:

- Aggressive behaviour: Lyketsos et al. (1999b).
- Anxiety: Gibbons et al. (2006).
- Autonomic symptoms: Allan et al. (2006).
- Awareness / Insight: Ott and Fogel (1992), Snow et al. (2005). Aalten et al. (2006).
- Delirium: Fick and Foreman (2000).
- Extrapyramidal signs in VD and AD: Simpson et al. (1999).
- Memory complaints: Wong et al. (2006).
- Negative symptoms in AD: Reichman et al. (1996).
- Neuropsychology: Doniger et al. (2006), Herrmann et al. (1995).
- Pain: Leong and Nuo (2007), Krulewitch et al. (2000).
- Palliative Care – Greenberg et al. (2004).
- Personality disorders: Abrams et al. (2001).
- Psychosis: Nambudiri et al. (1997), Ballard et al. (2001)
- Sexual relations in married dementia suffers: Ballard et al. (1997a).
- Sleep disturbance in AD: Tractenberg et al. (2005).
- Vocally disturbing behaviour in nursing homes: Draper et al. (2000), Dwyer and Byrne (2000)

To set the context for the use of CSDD clinical data, a brief discussion about the importance of measuring depression in dementia follows:

Burns et al. (2004) highlights the importance of depression in dementia as it is recognition of a potentially treatable condition (page 9). Cohen et al. (2003) outlines how depression screening leads to increased rates of treatment (anti-depression medication) in residential care. Teresi et al. (2002) has also used the CSDD and the GDS in depression recognition studies in residential care. Davidson et al. (2006) shows how a single educational training session, which included using the CSDD, improved GPs ability to recognise depression in residential care.

A study by Purandare et al. (2001) suggests that depression symptoms are common in both AD (without depression) and major depression in late life. Irritability, retardation and weight loss are common to both, while sadness, diurnal variation in mood, early or late insomnia differ.

Applications:

Like the GDS, the Cornell Depression Scale was used in the Challenge Depression Project conducted by the Hammond Care Group in 2004 (Web-site: [http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/ageing-chall-depress.htm/\\$FILE/challenge04.pdf](http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/ageing-chall-depress.htm/$FILE/challenge04.pdf)).

The Cornell Depression Scale was used and recommended in the National Trial of the Aged Care Funding Instrument (ACFI) (Web-site: <http://www.health.gov.au/internet/wcms/publishing.nsf/content/ageing-acfi-outcome.htm>) and the National Framework for Documenting Care in Residential Aged Care Services (NATFRAME) (Web-site: <http://www.health.gov.au/internet/wcms/publishing.nsf/Content/ageing-rescare-natframe.htm~ageing-rescare-natframe01.htm>). The ACFI modified the CSDD to streamline its administration in residential care. It also has provided severity grades.

Like the Geriatric Depression Scale, the CSDD is also in the Silver book of the Royal Australian College of General Practitioners (RACGP) <http://www.racgp.org.au/silverbookonline/4-0.asp> (Medical care of older persons in residential aged care facilities ('silver book') 4th Edition 2005).

NB: The Cornell Dysthymia Rating Scale (Cohen 1997 and Hellerstein et al., 2002) for less severe but chronic depression contains some items and is related to the Hamilton Depression Rating Scale (HAM-D) not the Cornell Depression Scale in Dementia (see Cohen 1997 for further details).

An advantage of the CSDD is that it covers the entire range of severity of dementia. Cummings (2005) endorses this common view saying that the CSDD is "particularly useful because allows rating of depression across the entire range of severity" (page s20). This is supported by research papers by Alexopoulos et al. (1988b), Ott and Fogel (1992), Muller-Thomsen et al. (2005) and Korner et al. (2006). However, a single paper was found by Allen et al. (2000) which did not support this case. They found that CSDD could not discriminate between depressed and non depressed subject with cognitive impairment. The results of Kurlowicz et al. (2002) supports the view that depression measurement methods less dependent on co-morbid medical illness, dementia and functional disability are to be preferred.

Detailed psychometric information comparing the CSDD and other noted instruments can be found in the following collections of papers.

- A number of papers compare the GDS and the CSDD (Ott and Fogel 1992; Maixer et al., 1995; Burrows et al., 2000; Krulowicz et al., 2000; Purandare et al., 2001; Teresi et al., 2002; Greenberg et al., 2004; Lam et al., 2004; Muller-Thomsen et al., 2005; Korner et al., 2006; Korner et al., 2007). Most papers address the coverage of dementia severity as described above, while the paper by Maixer et al. (1995) highlights the need for consistent rating approaches by clinicians.
- Another group of papers compares the CSDD and the Hamilton Depression Rating Scale (HAM-D/HDRS): (Vida et al., 1994; Burrows et al., 2000; Purandare et al., 2001; Mayer et al., 2006; Korner et al., 2007). The paper by Vida et al. (1984) demonstrates that both scales have similar screening properties for major depression in mild to moderate dementia, while Mayer et al. (2006) suggests that the CSDD's mood subscale is slightly better at detecting treatment effects.
- Two papers compare the SF-36 and the CSDD: Teri et al. (2003) and Allan et al. (2006).
- Burrows et al. (2000) and Hendrix et al. (2003) also provide data with the CSDD and Minimum Data Set; with the later suggesting that the MDS 2.0 requires more accurate assessment.

Carer and/or

Patient Use of Instrument:

The CSDD has been used in studies with depressed carers (see Ballard et al., 1995 and Nagatomo et al., 1998). Logsdon and Teri, (1995) support the validity of the use of informant reports by carers (spouse or adult child). The use of informants produces higher cut scores for mild depression on all measures (BDI, HAM-D and CSDD), but the internal properties and correlations with other measures were found to be comparable to the self-report versions of these scales.

Psychometric Criteria

RELIABILITY	Studies Reported & References	Adequacy Checks	Comment
<p>Internal consistency</p> <p>The extent to which items in a (sub) scale are inter-correlated; a measure of the homogeneity of a (sub)scale</p> <p>Cronbach's alpha should be between 0.70 and 0.90 for every dimension / sub-scale</p>	<p>Alexopoulos et al. (1988a) Alexopoulos et al. (1988b) Kurlowicz et al. (2002) Burns et al. (2004) Muller-Thomsen et al. (2005)</p>	<p><input checked="" type="checkbox"/> Alpha >0.70</p> <p><input type="checkbox"/> Marginal or inadequate internal consistency (<0.70)</p> <p><input type="checkbox"/> No information found on internal consistency</p>	<p>The original paper by Alexopoulos et al. (1988a) outlines and alpha value of 0.84 for demented patients (Also reported in Burns et al., 2004).</p> <p>Using Kuder-Richardson formula internal consistency = 0.98 for non demented patients (Alexopoulos et al., 1988b).</p> <p>Additional internal consistency information can be found in Kurlowicz et al. (2002) and Muller-Thomsen et al. (2005).</p>
<p>Test – retest</p> <p>The extent to which the same results are obtained on repeated administrations of the same questionnaire when no change in physical functioning has occurred</p> <p>Calculation of an intraclass correlation coefficient (ICC); and an ICC > 0.70 is desired</p> <p>Preferred if time interval and confidence intervals were presented</p>		<p><input type="checkbox"/> ICC >.70</p> <p>Time intervals and confidence intervals reported</p> <p><input type="checkbox"/> Marginal or inadequate test-retest reliability ICC<.70</p> <p><input checked="" type="checkbox"/> No information found on test-retest reliability</p>	<p>No information on test-retest reliability for English speaking samples was found.</p>
<p>Inter – rater</p> <p>Limits of agreement, Kappa, or standard error of measurement (SEM) were presented</p>	<p>Alexopoulos et al. (1998a) Alexopoulos et al. (1988b) Mack & Patterson (1994) Maixer et al. (1995) Burns et al. (2004)</p>	<p><input checked="" type="checkbox"/> Agreement reported and adequate</p> <p><input type="checkbox"/> Inadequate inter-rater agreement</p> <p><input type="checkbox"/> No information provided</p>	<p>High inter-rater reliability with dementia patients kappa = 0.67 (Alexopoulos et al., 1998a) This is also reported by Burns et al. (2004).</p> <p>High inter-rater reliability with non demented patients 0.74 (Alexopoulos et al., 1988b).</p> <p><i>Little work has been undertaken in this area apart from the original studies by the authors.</i></p> <p>Problems with ratings have been identified by Mack and Patterson (1994), namely, non-anchored scaling and confusing instructions.</p> <p>Maixer et al. (1995) also found some variability in CSDD scores for a group of</p>

			psychiatrists.
--	--	--	----------------

VALIDITY	Studies Reported & References	Adequacy Checks	Comment
<p>Content</p> <p>The extent to which the domain of interest is comprehensively sampled by the items in the questionnaire</p>	<p>Ballard et al. (1997b) Burns et al. (2004)</p>	<p><input type="checkbox"/> Patients and experts were involved during item selection and/or item reduction</p> <p><input type="checkbox"/> Patients were consulted for reading and comprehension</p> <p><input checked="" type="checkbox"/> No patient involvement</p> <p><input type="checkbox"/> No information found on content validity</p> <p><input checked="" type="checkbox"/> There is an adequate coverage of relevant domains</p> <p><input type="checkbox"/> There is limited coverage of relevant domains</p>	<p>Highly recommended measure (Burns et al., 2004), especially with the method of administration (patient and informant).</p> <p>A critique by Ballard et al. (1997b) of the CSDD is that it does not include the persistence of symptoms.</p>
<p>Construct</p> <p>The extent to which scores on the questionnaire relate to other measures in a manner that is consistent with theoretically derived hypothesis concerning the domains that are measured</p>	<p>Fick & Foreman (2000) Draper et al. (2000) Dwyer & Byrne (2000) Teri et al. (2003)</p>	<p><input checked="" type="checkbox"/> Results were acceptable in accordance with the hypotheses and an adequate comparison measure was used</p> <p><input type="checkbox"/> Limited /inadequate construct validity reported</p> <p><input type="checkbox"/> No information provided</p>	<p>Presence of delirium in hospitalised dementia patients is associated with depression (Fick and Foreman, 2000).</p> <p>Depression is related to vocally disturbing behaviour in nursing homes (Draper et al. , 2000; Dwyer and Byrne 2000).</p> <p>Teri et al. (2003) – an exercise and behavioural management program show improvements in function and physical health (as measured by SF-36) as well as depression.</p>
<p>Construct: Internal Structure</p> <p>Information provided on factor structure</p>	<p>Harwood et al. (1998) Kurlowicz et al. (2002) Mayer et al. (2006)</p>	<p><input type="checkbox"/> No evidence provided/failed a test of dimensionality</p> <p><input checked="" type="checkbox"/> Some evidence provided to support internal structure</p> <p><input type="checkbox"/> Substantial evidence provided to support internal structure</p>	<p>A five factor solution was found in the original papers.</p> <p>Harwood et al. (1998) found a four factor structure (43% variance) - General Depression, Rhythm Disturbances, Agitation Psychosis and Negative Symptoms – in outpatients with probable AD.</p> <p>Kurlowicz et al. (2002) found a four factor structure – Depression, Somatic/ Vegetative, Disturbed Sleep and Anxiety – in a residential care population.</p> <p>The mood subscale is the best</p>

			for detecting change (Mayer et al., 2006).
<p>Construct: Correlation with other measures</p> <p>Comparisons made to other measures</p>	<p>Loreck et al. (1994) Lyketos et al. (1999b) Nagatomo et al. (2001) Watson et al. (2003) Selwood et al. (2005) Gibbons et al. (2006) Korner et al. (2006) Wong et al. (2006) Watson et al. (2006) Leong & Nuo (2007)</p>	<p>X Correlations with other measures are reported <input type="checkbox"/> Correlations not reported</p>	<p>There are a number of studies in this area:</p> <p>Constructs: CSDD correlates with: physically aggressive behaviour (Lyketos et al., 1999b); abnormal behaviour in residential care (Nagatomo et al., 2001); QoL at one year follow-up (Selwood et al., 2005); memory complaints (0.33) (Wong et al., 2006); the need for ADL assistance (Watson et al., 2006); pain related mood disturbance (Leong and Nuo, 2007).</p> <p>Watson et al. (2003) studying a group of 2078 residents in assisted living in Florida found that depression, as measured by the CSDD, correlated with medical co-morbidity, social withdrawal, psychosis, agitation and length of time in facility. As well it was associated with greater discharge to residential care and higher rates of mortality for the severely depressed.</p> <p>Measures: Correlates with Dementia Signs and Symptoms (DSS) Scale (Loreck et al., 1994) and the GDS (Korner et al. 2006).</p> <p>The CSDD has overlapping items with anxiety measures (Gibbons et al., 2006) e.g. RAID = 0.66; NPI Anxiety = 0.42.</p> <p>See also the Applications section above for further papers on the HRSD/ HAM-D, GDS, SF-36 and MDS.</p>
<p>Construct: Discriminant Validity</p> <p>The scale differentiates between relevant categories of respondent e.g. sick vs. well, varying degrees of severity</p>	<p>Patterson et al. (1990)</p> <p>Maixer et al. (1995)</p> <p>Ballard et al. (1996a)</p>	<p>X Scale differentiates between relevant categories of respondents <input type="checkbox"/> No information on discriminant validity</p>	<p>AD patients are more likely to show mild and moderate symptoms of depression than spousal controls (Patterson, et al., 1990).</p> <p>Maixner et al. (1995) found that the CSDD differentiates between depressed and non depressed individuals with a clinical diagnosis of depression.</p> <p>Ballard et al. (1996a) using</p>

	<p>Ballard et al. (1996b)</p> <p>Korner, et al. (2007)</p>		<p>RDC for major and minor depression across different types of dementia found that depression occurred more often and was more severe in VD patients rather than AD patients. In a follow-up study, Ballard et al. (1996b) found that for 20% of all patients with depression their symptoms persisted for six months or longer.</p> <p>Finally, the HDRS / HAM-D seems to be better instrument in terms of scalability in cognitively intact and cognitively impaired populations than GDS and Cornell (using Rasch analysis and Mokken coefficient; Korner et al., 2007).</p>
<p>Criterion</p> <p>Information on the relationship of scores to gold standard measures or clinical diagnosis is provided</p>	<p>Alexopoulos et al. (1988a)</p> <p>Alexopoulos et al. (1988b)</p> <p>Vida et al. (1994)</p> <p>Ballard et al. (1997b)</p> <p>Burns et al. (2004)</p> <p>Greenberg et al. (2004)</p> <p>Lam et al. (2004)</p> <p>Muller-Thomsen et al. (2005)</p> <p>Korner et al. (2006)</p>	<p>X Comparison made to criterion measures</p> <p><input type="checkbox"/> No comparison with criterion measures provided</p>	<p>In terms of criterion validity, the CSDD compares well with diagnostic criteria and HAM-D / HDRS (Burns et al., 2004), and usually performs better than the GDS.</p> <p>The CSDD correlates 0.83 with depression severity levels in demented patients - according to Research Diagnostic Criteria (RDC) (Alexopoulos et al., 1988a).</p> <p>The CSDD also correlates 0.81 (Spearman) with RDC for depression severity levels in demented and non demented patients (Alexopoulos, et al., 1988b).</p> <p>The CSDD is equivalent to HDS when using the RDC for major depression in mild to moderate AD (Vida et al., 1994).</p> <p>The CSDD score is similar to DSM-III-R and RDC criteria for major depression – though the issue of the persistence of symptoms is missing (Ballard et al., 1997b).</p> <p>The CSDD is better a screening tool than the GDS when compared to two independent clinicians using the ICD-10. Plus it is equally valid in demented and non-demented patients unlike the GDS (Korner et al., 2006).</p> <p>There is lower agreement between the CSDD and DSM-IV in a palliative care</p>

			<p>population when compared to the GDS. But, as stated by the authors, the CSDD is the only tool which could be used with severe dementia patients (MMSE = 0) (Greenberg et al., 2004).</p> <p>The CSDD is the best at detecting depression when compared with the GDS and the Even Briefer Assessment Scale for Depression in Chinese Elderly. The authors recommended a single depression question followed by the CSDD if necessary (Lam et al., 2004).</p> <p>Muller-Thomsen et al. (2005) also found the CSDD is better in detecting depression in mild and moderate to severe AD (using the MMSE as the criterion) than the GDS and NOSGER (Muller-Thomsen et al., 2005).</p> <p><i>See also the related papers by Mayer et al. (2006) and Korner et al. (2007) comparing the HAM-D / HDRS and CSDD.</i></p>
<p>Interpretability</p> <p>The degree to which one can assign qualitative meaning to quantitative scores</p> <p>Do authors provide the following:</p> <p>Presentation of means and SD of scores before and after treatment</p> <p>Comparative data on the distribution of scores in relevant subgroups</p> <p>Information on the relationship of scores to well-known functional measures or clinical diagnosis</p> <p>Information on the association between changes in scores and patients' global ratings of the magnitude of change they have experienced</p>	<p>Watson et al. (2003)</p> <p>Burns et al. (2004) Challenge Depression Project (see above)</p> <p>ACFI data (see above)</p> <p>Watson et al. (2006)</p>	<p>X Authors provide 2 or more types of information on interpretability</p> <p><input type="checkbox"/> Authors provide limited information to assist with interpretability</p> <p><input type="checkbox"/> No information provided</p>	<p>A score of 10 or more indicates a probable major depression. Scores above 18 indicate a definite major depression. (Source: Administration and Scoring Guidelines).</p> <p>Papers by Watson et al. (2003) and Watson et al. (2006) set the cut score at 7 or more for residents in assisted living facilities.</p> <p>Burns et al. (2004) repeats the common view that the cut-score is 8.</p> <p>Australian data and guidelines are provided in the ACFI national trial data and the Challenge Depression Project.</p>

RESPONSIVENESS	Studies Reported & References	Adequacy Checks	Comment
<p>Floor and ceiling effects</p> <p>The questionnaire fails to demonstrate a worse score in patients who clinically deteriorated and an improved score in patients who clinically improved</p> <p>Authors should provide descriptive statistics of the distribution of scores</p>		<p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and no major floor or ceiling effects detected</p> <p><input type="checkbox"/> Descriptive statistics of the distribution of scores were presented and more than 15% of respondents achieved the highest or lowest possible score</p> <p>X No information provided on floor and ceiling effects.</p>	<p>No information for the CSDD was found.</p>
<p>Sensitivity to change</p> <p>The ability to detect important change over time in the concept being measured</p>	<p>Mayer et al. (2006)</p> <p>See also the Drug treatment studies listed above.</p>	<p>X Hypotheses were formulated and results were in agreement</p> <p><input type="checkbox"/> An adequate metric was used (ES, SRM, comparison with external standard)</p> <p><input type="checkbox"/> No information on sensitivity to change was provided</p> <p><input type="checkbox"/> MCID - Information was provided about the magnitude of score differences which would be clinically meaningful</p> <p>X MCID – No information was provided.</p>	<p>Slightly better than HDRS / HAM-D and much better than NPI-M in looking at drug treatment effects (Mayer et al., 2006).</p> <p>The Mood Subscale is the best for detecting change (Mayer et al., 2006).</p> <p>See also the drug treatment studies listed earlier.</p> <p>MCID information was not found.</p>

Cultural Applicability and Cultural Adaptations:

Used with Japanese (Schreiner et al., 2003), Korean (Shah et al., 2005), Spanish (Ownby et al., 2001, Harwood et al., 2000), French (Camus et al., 1995), Chinese (Lam et al., 2004) and Turkish (Amuk et al., 2003) speaking patients or community populations.

Gender Appropriateness:

Appropriate for use with both genders.

Age Appropriateness:

Although mainly used with elderly people it is appropriate for use with adults.

Summary: The CSDD is a widely used and highly respected measure. Burns et al. (2004) state that the CSDD “sets the standard” in the area of depression measurement in severe dementia, when measurement by an informant is required. However, since the original publications of the CSDD, little work has been published on scale’s inter-rater reliability. Up to date, reliability information is of vital importance if a clinical rating scale is going to be used in routine assessments by different practitioners, across different practice settings.

Reporter: Nicholas Marosszeky

Date of report: August 2007

References

Aalten P, van Valen E, de Vugt ME, et al. (2006) *Awareness and behavioral problems in dementia patients: a prospective study*. International Psychogeriatrics. Vol. 18, No.1, pp.3-17.

Abrams RC, Alexopoulos GS, Spielman LA, et al. (2001) *Personality disorder symptoms predict declines in global functioning and quality of life in elderly depressed patients*. American Journal of Geriatric Psychiatry. Vol. 9, No.1, pp.67-71.

Alexopoulos GS, Abrams RC, Young RC, et al. (1988) *Cornell scale for depression in dementia*. Biological Psychiatry. Vol. 23, No.3, pp.271-284.

Alexopoulos GS, Abrams RC, Young RC, et al. (1988) *Use of the Cornell scale in nondemented patients*. Journal of the American Geriatrics Society. Vol. 36, No.3, pp.230-236.

Allan L, McKeith I, Ballard C, et al. (2006) *The prevalence of autonomic symptoms in dementia and their association with physical activity, activities of daily living and quality of life*. Dementia and Geriatric Cognitive Disorders. Vol. 22, No.3, pp.230-237.

Amuk T, Karadag F, Oguzhanoglu N, et al. (2003) *Reliability and validity of the Cornell Scale for Depression in dementia in an elderly Turkish population*. Turk Psikiyatri Dergisi. Vol. 14, No.4, pp.263-271.

Ashida S (2000) *The effect of reminiscence music therapy sessions on changes in depressive symptoms in elderly persons with dementia*. Journal of Music Therapy. Vol. 37, No.3, pp.170-182.

Bains J, Birks JS and Dening TD (2007) *Antidepressants for treating depression in dementia (Review)*. Cochrane Database of Systematic Reviews. No. 3, pp.1-27.

Ballard CG, Saad K, Coope B, et al. (1995) *The aetiology of depression in the carers of dementia sufferers*. Journal of Affective Disorders. Vol. 35, No.1-2, pp.59-63.

Ballard C, Bannister C, Solis M, et al (1996a) *The prevalence, associations and symptoms of depression amongst dementia sufferers*. Journal of Affective Disorders. Vol. 36, No.3-4, pp.135-44.

Ballard CG, Patel A, Solis M, et al. (1996b) *A one-year follow-up study of depression in dementia sufferers*. The British Journal of Psychiatry. Vol. 168, No.3, pp.287-291.

Ballard CG, Solis M, Gahir M, et al. (1997a) *Sexual relationships in married dementia sufferers*. International Journal of Geriatric Psychiatry. Vol. 12, No.4, pp.447-451.

Ballard CG, Coope B, Qyebode F, et al. (1997b) *Depression in dementia sufferers - comparison of diagnostic criteria*. Journal of the American Geriatrics Society. Vol. 45, No.1, pp.123-124.

Ballard CG, O'Brien JT, Swann AG, et al. (2001) *The natural history of psychosis and depression in dementia with Lewy bodies and Alzheimer's disease: Persistence and new cases over 1 year of follow-up*. Journal of Clinical Psychiatry Vol .62, No.1, pp.46-49.

Beblo T and Driessen M (2002) *No melancholia in poststroke depression? A phenomenologic comparison of primary and poststroke depression*. Journal of Geriatric Psychiatry and Neurology. Vol. 15, No.1, pp.44-49.

Brody H, Draper BM, Millar J, et al. (2003) *Randomized controlled trial of different models of care for nursing home residents with dementia complicated by depression or psychosis*. Journal of Clinical Psychiatry. Vol. 64, No.1, pp.63-72.

Burrows AB, Morris JN, Simon SE, et al. (2000) *Development of a minimum data set-based depression rating scale for use in nursing homes*. Age and Ageing. Vol. 29, No.2, pp.165-172.

Burns A, Lawlor B and Craig S (2004) *Assessment scales in old age psychiatry*. Taylor & Francis, London.

Callahan CM, Boustani MA, Unverzagt FW, et al. (2006) *Effectiveness of Collaborative Care for Older Adults With Alzheimer Disease in Primary Care: A Randomized Controlled Trial*. Journal of the American Medical Association. Vol. 295, No.18, pp.2148-2157.

Camus V, Schmitt L, Ousset PJ, et al. (1995) *Depression and dementia: A French validation of the Cornell Scale for Depression in Dementia (CSDD) and the Dementia Mood Assessment Scale (DMAS)*. L'Encephale. Vol. 21, No.3, pp.201-208.

Cheston R, Jones K and Gilliard J (2003) *Group psychotherapy and people with dementia*. Aging and Mental Health. Vol. 7, No.6, pp.452-461.

Cohen J (1997) *Assessment and treatment of dysthymia: The development of the Cornell Dysthymia Rating Scale*. European Psychiatry. Vol. 12, No.4, pp.190-193.

Cohen CI, Hyland K and Devlin M (1999) *An evaluation of the use of the natural helping network model to enhance the well-being of nursing home residents*. Gerontologist. Vol.39, No.4, pp.426-433.

Cohen CI, Hyland K and Kimhy D (2003) *The utility of mandatory depression screening of dementia patients in nursing homes*. American Journal of Psychiatry. Vol. 160, No.11, pp.2012-2017.

Cruz-Jentoft A, Burón J, Jesús D, et al. (2005) *Risperidone in the treatment of behavioural and psychological symptoms of dementia in patients diagnosed with vascular or mixed-type dementia*. International Journal of Psychiatry in Clinical Practice. Vol. 9, No.1, pp.45-51.

Cummings JL (2005) *Neuropsychiatric and behavioral alterations and their management in moderate to severe Alzheimer disease*. Neurology. Vol. 65, No.6, Suppl.3, pp.S18-S24.

Doniger GM, Dwolatzky T, Zucker DM, et al. (2006) *Computerized cognitive testing battery identifies mild cognitive impairment and mild dementia even in the presence of depressive symptoms*. American Journal of Alzheimer's Disease and Other Dementias. Vol. 21, No.1, pp.28-35.

Dwyer M and Byrne GJ (2000) *Disruptive vocalization and depression in older nursing home residents*. International Psychogeriatrics. Vol. 12, No.4, pp.463-471.

Fick D and Foreman M (2000) *Consequences of not recognizing delirium superimposed on dementia in hospitalized elderly individuals*. Journal of Gerontological Nursing. Vol. 26, No.1, pp.30-40.

Gibbons LE, Teri L, Logsdon RG, et al. (2006) *Assessment of Anxiety in Dementia: An Investigation into the Association of Different Methods of Measurement*. Journal of Geriatric Psychiatry and Neurology. Vol. 19, No.4, pp.202-208.

Greenberg L, Lantz MS, Likourezos A, et al. (2004) *Screening for depression in nursing home palliative care patients*. Journal of Geriatric Psychiatry and Neurology. Vol. 17, No.4, pp.212-218.

Hall KA, Keks NA and O'Connor DW (2005) *Transdermal estrogen patches for aggressive behavior in male patients with dementia: a randomized, controlled trial*. International Psychogeriatrics. Vol. 17, No.2, pp.165-178.

Harwood DG, Ownby RL, Barker WW, et al. (1998) *The factor structure of the Cornell Scale for Depression in Dementia among probable Alzheimer's disease patients*. American Journal of Geriatric Psychiatry. Vol. 6, No.3, pp.212-220.

Harwood DG, Barker WW, Ownby RL, et al. (2000) *Depressive symptoms in Alzheimer's disease. An examination among community-dwelling Cuban American patients.* American Journal of Geriatric Psychiatry. Vol. 8, No.1, pp.84-91.

Hellerstein DJ, Batchelder ST, Lee A, et al. (2002) *Rating dysthymia: An assessment of the construct and content validity of the Cornell Dysthymia Rating Scale.* Journal of Affective Disorders. Vol. 71, No.1-3, pp.85-96.

Hendrix CC, Sakauye KM, Karabatsos G, et al. (2003) *The use of the Minimum Data Set to identify depression in the elderly.* Journal of the American Medical Directors Association. Vol. 4, No.6, pp.308-312.

Herrmann M, Bartels C, Schumacher M, et al. (1995) *Poststroke depression: Is there a pathoanatomic correlate for depression in the postacute stage of stroke?* Stroke. Vol. 26, No.5, pp.850-856.

Herrmann M, Freyholdt U, Fuchs G, et al. (1997) *Coping with chronic neurological impairment: a contrastive analysis of Parkinson's disease and stroke.* Disability and Rehabilitation. Vol. 19, No.1, pp.6-12.

Korner A, Lauritzen L, Abelskov K, et al. (2007) *Rating scales for depression in the elderly: external and internal validity.* Journal of Clinical Psychiatry. Vol. 68, No.3, pp.384-389.

Krulewicz H, London MR, Skakel VJ, et al. (2000) *Assessment of pain in cognitively impaired older adults: A comparison of pain assessment tools and their use by non-professional caregivers.* Journal of the American Geriatrics Society. Vol. 48, No.12, pp.1607-1611.

Kurlowicz LH, Evans LK, Strumpf NE, et al. (2002) *A psychometric evaluation of the Cornell Scale for Depression in dementia in a frail nursing home population.* American Journal of Geriatric Psychiatry. Vol. 10, No.5, pp.600-608.

Lam CK, Lim PPJ, Low BL, et al. (2004) *Depression in dementia: A comparative and validation study of four brief scales in the elderly Chinese.* International Journal of Geriatric Psychiatry. Vol.19, No. 5, pp.422-428.

Leong IY and Nuo TH (2007) *Prevalence of pain in nursing home residents with different cognitive and communicative abilities.* Clinical Journal of Pain. Vol. 23, No.2, pp.119-127.

Logsdon RG and Teri L (1995) *Depression in Alzheimer's disease patients: Caregivers as surrogate reporters.* Journal of the American Geriatrics Society. Vol. 43, No.2, pp.150-155.

Loreck DJ, Bylsma FW and Folstein MF (1994) *The Dementia Signs and Symptoms Scale: A new scale for comprehensive assessment of psychopathology in Alzheimer's disease.* American Journal of Geriatric Psychiatry. Vol. 2, No.1, pp.60-74.

Lyketsos CG, Lindell Veiel L, Baker A, et al. (1999a) *A randomized, controlled trial of bright light therapy for agitated behaviors in dementia patients residing in long-term care.* International Journal of Geriatric Psychiatry. Vol. 14, No.7, pp.520-525

Lyketsos CG, Steele C, Galik E, et al. (1999b) *Physical aggression in dementia patients and its relationship to depression.* American Journal of Psychiatry. Vol. 156, No.1, pp.66-71.

Lyketsos CG, Sheppard J, Steele CD, et al. (2000) *Randomized, placebo-controlled, double-blind clinical trial of sertraline in the treatment of depression complicating Alzheimer's disease: Initial results from the depression in Alzheimer's disease study.* American Journal of Psychiatry. Vol. 157, No.10, pp.1686-1689.

Lyketsos CG, DelCampo L, Steinberg M, et al. (2003) *Treating depression in Alzheimer disease: Efficacy and safety of sertraline therapy, and the benefits of depression reduction: The DIADS.* Archives of General Psychiatry. Vol. 60, No.7, pp.737-746.

Mack JL and Patterson MB (1994) *The evaluation of behavioral disturbances in Alzheimer's disease: The utility of three rating scales.* Journal of Geriatric Psychiatry and Neurology. Vol. 7, No.2, pp.99-115.

Magai C, Kennedy G, Cohen CI, et al. (2000) *A controlled clinical trial of sertraline in the treatment of depression in nursing home patients with late-stage Alzheimer's disease.* American Journal of Geriatric Psychiatry. Vol. 8, No.1, pp.66-74.

Maixner SM, Burke WJ, Roccaforte WH, et al. (1995) *A comparison of two depression scales in a geriatric assessment clinic*. American Journal of Geriatric Psychiatry. Vol. 3, No.1, pp.60-67.

Mayer LS, Bay RC, Politis A, et al. (2006) *Comparison of three rating scales as outcome measures for treatment trials of depression in Alzheimer disease: findings from DIADS*. International Journal of Geriatric Psychiatry. Vol. 21, No.10, pp.930-936.

McKeith I, Cummings J, Lovestone S, et al. (1999) *Outcome measures in Alzheimer's Disease*. Martin Dunitz, London.

Moretti R, Torre P, Antonello RM, et al. (2002) *An open-label pilot study comparing rivastigmine and low-dose aspirin for the treatment of symptoms specific to patients with subcortical vascular dementia*. Current Therapeutic Research. Vol. 63, No.7, pp.443-458.

Moretti R, Torre P, Antonello RM, et al. (2004) *Rivastigmine in frontotemporal dementia: an open-label study*. Drugs and Aging Vol. 21, No.14, pp.931-937.

Müller-Thomsen T, Arlt S, Mann U, et al. (2005) *Detecting depression in Alzheimer's disease: evaluation of four different scales*. Archives of Clinical Neuropsychology. Vol. 20, No.2, pp.271-276.

Nambudiri DE, Teusink JP, Fensterheim L, et al. (1997) *Age and psychosis in degenerative dementia*. International Journal of Geriatric Psychiatry. Vol. 12, No.1, pp.11-14.

Nagatomo I and Takigawa M (1998) *Mental status of the elderly receiving home health services and the associated stress of home helpers*. International Journal of Geriatric Psychiatry. Vol. 13, No.1, pp.57-63.

Nagatomo I, Akasaki Y, Tominaga M, et al. (2001) *Abnormal behavior of residents in a long-term care facility and the associated stress of care staff members*. Archives of Gerontology and Geriatrics. Vol. 33, No.3, pp.203-210.

Nelson JC, Hollander SB, Betzel J, et al. (2006) *Mirtazapine orally disintegrating tablets in depressed nursing home residents 85 years of age and older*. International Journal of Geriatric Psychiatry. Vol. 21, No.9, pp.898-901.

Ott BR and Fogel BS (1992) *Measurement of depression in dementia: Self vs clinician rating*. International Journal of Geriatric Psychiatry. Vol. 7, No.12, pp.899-904.

Ownby RL, Harwood DG, Acevedo A, et al. (2001) *Factor structure of the Cornell Scale for Depression in Dementia for Anglo and Hispanic patients with dementia*. American Journal of Geriatric Psychiatry. Vol. 9, No.3, pp.217-224.

Ozge C, Ozge A and Unal O (2006) *Cognitive and functional deterioration in patients with severe COPD*. Behavioural Neurology. Vol. 17, No.2, pp.121-130.

Panisset M, Gauthier S, Moessler H, et al. (2002) *Cerebrolysin in Alzheimer's disease: a randomized, double-blind, placebo-controlled trial with a neurotrophic agent*. Journal of Neural Transmission. Vol. 109, No.7-8, pp.1089-1104.

Patterson MB, Schnell AH, Martin RJ, et al. (1990) *Assessment of behavioral and affective symptoms in Alzheimer's disease*. Journal of Geriatric Psychiatry and Neurology. Vol. 3, No.1, pp.21-30.

Perrault A, Oremus M, Demers L, et al. (2000) *Review of outcome measurement instruments in Alzheimer's disease drug trials: Psychometric properties of behavior and mood scales*. Journal of Geriatric Psychiatry and Neurology. Vol. 13, No.4, pp.181-196.

Purandare N, Burns A, Craig S, et al. (2001) *Depressive symptoms in patients with Alzheimer's disease*. International Journal of Geriatric Psychiatry. Vol. 16, No.10, pp.960-964.

Reichman WE, Coyne AC, Amirneni S, et al. (1996) *Negative symptoms in Alzheimer's disease*. American Journal of Psychiatry. Vol. 153, No.3, pp.424-426.

- Roose SP, Nelson JC, Salzman C, et al. (2003) *Open-label study of mirtazapine orally disintegrating tablets in depressed patients in the nursing home*. Current Medical Research and Opinion. Vol. 19, No.8, pp.737-746.
- Schottke H, Springer U, Grimsehl A, et al. (2001) *Prevalences and lifetime prevalences of affective disorders and anxiety disorders after stroke*. Zeitschrift fur Neuropsychologie. Vol. 12, No.4, pp.256-263.
- Schneider LS, Pollock VE, Zemansky MF, et al. (1991) *A pilot study of low-dose L-deprenyl in Alzheimer's disease*. Journal of Geriatric Psychiatry and Neurology. Vol. 4, No.3, pp.143-148.
- Schreiner AS and Morimoto T (2002) *Factor structure of the Cornell Scale for Depression in Dementia among Japanese poststroke patients*. International Journal of Geriatric Psychiatry. Vol. 17, No.8, pp.715-722.
- Schreiner AS, Hayakawa H, Morimoto T, et al. (2003) *Screening for late life depression: Cut-off scores for the Geriatric Depression Scale and the Cornell Scale for Depression in Dementia among Japanese subjects*. International Journal of Geriatric Psychiatry. Vol. 18, No.6, pp.498-505.
- Selwood A, Thorgrimsen L and Orrell M (2005) *Quality of life in dementia - a one-year follow-up study*. International Journal of Geriatric Psychiatry. Vol. 20, No.3, pp.232-237.
- Shah A, Ellanchenny N and Suh G (2005) *A comparative study of behavioral and psychological symptoms of dementia in patients with Alzheimer's disease and vascular dementia referred to psychogeriatric services in Korea and the U.K.* International Psychogeriatrics. Vol. 17, No.2, pp.207-219.
- Simpson S, Allen H, Tomenson B, et al. (1999) *Neurological correlates of depressive symptoms in Alzheimer's disease and vascular dementia*. Journal of Affective Disorders. Vol. 53, No.2, pp.129-136.
- Snow AL, Kunik ME, Molinari VA, et al. (2005) *Accuracy of Self-Reported Depression in Persons with Dementia*. Journal of the American Geriatrics Society. Vol. 53, No.3, pp. 389-396.
- Steinberg M, Munro CA, Samus Q, et al. (2004) *Patient predictors of response to treatment of depression in Alzheimer's disease: the DIADS study*. International Journal of Geriatric Psychiatry. Vol. 19, No.2, pp.144-150.
- Teresi J, Abrams R, Holmes D, et al. (2001) *Prevalence of depression and depression recognition in nursing homes*. Social Psychiatry and Psychiatric Epidemiology. Vol. 36, No.12, pp.613-620.
- Teri L, Gibbons LE, McCurry SM, et al. (2003) *Exercise plus behavioral management in patients with Alzheimer disease: a randomized controlled trial*. Journal of the American Medical Association. Vol. 290, No.15, pp.2015-2022.
- Tractenberg RE, Singer CM and Kaye JA (2005) *Symptoms of sleep disturbance in persons with Alzheimer's disease and normal elderly*. Journal of Sleep Research. Vol. 14, No.2, pp.177-185.
- van Weert JCM, van Dulmen AM, Spreeuwenberg PM, et al. (2005) *Behavioral and mood effects of snoezelen integrated into 24-hour dementia care*. Journal of the American Geriatrics Society. Vol. 53, No.1, pp.24-33.
- Vespa A, Gori G and Spazzafumo L (2002) *Evaluation of non-pharmacological intervention on antisocial behavior in patients suffering from Alzheimer's disease in a day care center*. Archives of Gerontology and Geriatrics. Vol. 34, No.1, pp.1-8.
- Vida S, Des Rosiers P, Carrier L, et al. (1994) *Depression in Alzheimer's disease: receiver operating characteristic analysis of the Cornell Scale for Depression in Dementia and the Hamilton Depression Scale*. Journal of Geriatric Psychiatry and Neurology. Vol. 7, No.3, pp.159-162.
- Watson LC, Garrett JM, Sloane PD, et al. (2003) *Depression in assisted living: results from a four-state study*. American Journal of Geriatric Psychiatry. Vol. 11, No.5, pp.534-542.
- Watson LC, Lehmann S, Mayer L, et al. (2006) *Depression in assisted living is common and related to physical burden*. American Journal of Geriatric Psychiatry. Vol. 14, No.10, pp.876-883.

Wong CHY, Lam LCW, Lui VWC, et al. (2006) *Subjective complaints and self-evaluation of memory test performance in Questionable dementia*. International Journal of Geriatric Psychiatry. Vol. 21, No.10, pp.937-944.

Attachment 7: Membership of the ACAP ECRG

AGED CARE ASSESSMENT PROGRAM EXPERT CLINICAL REFERENCE GROUP. MEMBERSHIP

Dr Susan Hunt (Chair)	Senior Adviser, Ageing and Aged Care Division, Department of Health and Ageing
Professor Jenny Abbey	Clinical Professor, Faculty of Health Sciences, University of Adelaide, Adjunct Professor, Queensland University of Technology, Research Fellow, Menzies Institute, University of Tasmania
Assoc Prof Gideon Caplan	Director, Post Acute Care Services, the Prince of Wales Hospital PACS Unit, NSW
Dr Terence Finnegan	Aged Care and Rehabilitation Department, Royal North Shore Hospital, NSW
Professor Leon Flicker	Director, WA Centre for Health and Ageing, Royal Perth Hospital, WA
Ms Therese Gehrig	Manager, Aged and Community Care Policy, ACT Health, (ACAP Official representative)
Ms Wendy Hubbard	Executive Director, Allied Health, Ballarat Health Services, Victoria
Dr Brendan Kay	General Practitioner, Jamieson Street Medical, Victoria
Assoc Prof Michael Murray	Director, Geriatric Medicine, St Vincent's Hospital, Victoria
Mr Tony Pyke	Manager, Adelaide Metro Aged Care Assessment Team, Domiciliary Care South Australia (ACAT Member representative)
Ms Michelle Roffey	Director, ACAP Section, Department of Health and Ageing
Assoc Prof Janet Sansoni	Associate Professor, Australian Health Outcomes Collaboration, ACT ; Centre for Health Service Development, University of Wollongong
Ms Trudy Sutton	Manager, Business Development, ACH Group, SA
Ms Jenny Stevens	Area Director Aged Care WA Country Health Service, WA
Dr Eddy Strivens	Regional Geriatrician, Aged Care Health Services, Queensland Health
Assoc Prof Paul Varghese	Director, Geriatric and Rehabilitation Unit Princess Alexandra Hospital, Queensland
Ms Wendy Venn	Aged Care Nurse Practitioner, Aged Care and Rehabilitation Unit, ACT
Ms Elizabeth Lovell	Assistant Director, ACAP Section, Department of Health and Ageing (Secretariat)
Ms Helena Kujansuu	ACAP Section, Department of Health and Ageing (Secretariat)