



# **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**

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Centre for Health Service Development  
Faculty of Health and Behavioural Sciences



*Kathy Eagar*

*Alan Owen*

*David Cromwell*

*Roslyn Poulos*

*Linda Adamson*

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## Executive Summary and Summary of Recommendations

This is the first of two reports on the HACC Dependency Data Items Project.

Consistent with our terms of reference, this Stage 1 report:

- reviews the suitability of existing instruments and scales to measure the dependency levels of the HACC target group and
- makes recommendations on whether one or more existing measures should be selected or whether a new measure is required.

Stage 2 will involve refinement of the instruments recommended in Stage 1, field testing to ensure their suitability across the spectrum of HACC services and a final report on the performance of the measures and on implementation issues.

A number of recommendations are included in this report that influence the shape of Stage 2 of the project. They are:

- 1 It is recommended that the functional dependency items be developed on the assumption of a two tiered assessment process. The first tier consists of a simple functional screening. The second tier consists of a more comprehensive assessment for those who require it.
- 2 It is recommended that 4 domains be included in the first tier functional screening tool:
  - Domestic (instrumental) functioning,
  - Self-care (motor) functioning
  - Challenging behaviour and
  - Cognitive functioning
- 3 No existing functional screening instrument is recommended at this stage. The selection/development of the initial functional screening instrument constitutes a major component of the work to be undertaken in Stage 2.
- 4 It is recommended that the HACC sector approve two self-care assessment instruments – the Barthel Index and the Functional Independence Measure (FIM).
- 5 The recommended self-care assessment instrument for the sector is the Barthel Index and FIM data can be mapped to the Barthel Index for reporting purposes.
- 6 It is recommended that a modified version of the Lawton's IADL measure be adopted as the standard measure of instrumental functioning.
- 7 It is recommended that cognitive screen results, but not assessment results, be included in the HACC MDS.
- 8 In relation to cognitive functioning, it is recommended that the HACC MDS include the following items:
  - The results of the cognitive screening. This can be a simply yes/no response to the question 'does the person have a cognitive impairment?'
  - Whether or not the person has been diagnosed with Dementia
  - Where or not the person was referred for a cognitive assessment.

- If so, the name of the instrument used. A list of the common assessment instruments can be included in computerised information systems as a drop-down list.
  - If so, whether the assessment confirmed the screening result.
- 9 No existing measure of challenging behaviour is recommended at this stage. The instrument to be used in the assessment of challenging behaviour will be addressed in Stage 2.
- 10 The extent of testing required in Stage 2 is determined by the outcomes of the Stage 1 findings. We propose that Stage 2 testing consist of the following:
- Field test the common functional screening instrument
  - Field test the preferred motor function assessment instrument (the Barthel Index) in those settings where it is not in use;
  - Field test the preferred instrumental function assessment instrument (a modified form of the Lawton's) in a variety of settings;
  - Field test the preferred cognitive function assessment instrument (the MMSE) in a variety of settings;
  - Field test the preferred behaviour instrument (the behaviour items in the RCS modified for use in a community setting) in a variety of settings.

# 1 Introduction

This is the first of two reports on the HACC Dependency Data Items Project.

This Stage 1 report:

- reviews the suitability of existing instruments and scales to measure the dependency levels of the HACC target group and
- makes recommendations on whether one or more existing measures should be selected or whether a new measure is required.

Stage 2 will involve refinement of the instruments recommended in Stage 1, field testing to ensure their suitability across the spectrum of HACC services and a final report on the performance of the measures and on implementation issues.

A Joint HACC/ACAP Assessment Working Group has been established by the Commonwealth to act as a Steering Group for the HACC dependency data items project. That group met on 30 October 2000 and resolved several key issues that influence the shape of the current report:

- The concept of a tiered approach to assessment is acceptable;
- Mapping existing instruments to each other through field testing in Stage 2 would be an acceptable option. This decision influenced the nature of the literature review and other work in Stage 1;
- Stage 2 is to be a field test and not a research study on the performance of the instruments. Its purpose is to ensure that the selected measures are practical for use in routine practice and that they meet the project objectives.

## 1.1 *Critical issues in designing dependency items*

The collection of dependency data will only be useful if it informs decision making. In the ideal world, different data would be collected for different purposes. However, the HACC program needs a dependency data set that can serve a number of different purposes:

- Assist consumers receive services that are appropriate to their needs;
- Assist providers to systematically assess the needs of individual consumers and provide services appropriate to those needs;
- Assist managers and planners to evaluate the appropriateness and success of the program. Aggregated dependency data will inform the development of effective planning strategies and funding mechanisms of HACC services, including the increasing use of funding linked to individuals and different consumer types.

It follows that the choice of instrument cannot be divorced from considerations of its use. The instrument needs to be:

- Appropriate for use in a variety of different settings, with consumers with diverse needs and by providers who have different training and skills.
- Able to yield information that is useful at the individual level – if providers do not find the information useful, its collection will become a burden for providers and the subsequent data quality will be poor.

- Able to yield information that is useful at an aggregate level – if funders and managers do not find the information useful, there will be little ongoing commitment to resourcing its collection or to improving it over time.

These requirements suggest a range of critical issues that are discussed below.

## **1.2 Definition of function**

A measure of dependency is a measure that identifies key areas in which a person requires assistance with daily living and that quantifies the extent to which the person has to rely on someone else to help them carry out normal activities of living in their own home and in the community. Functional measures may also need to capture factors in the external environment such as accessibility to transport and the layout of the home.

A number of issues around the definition of function were addressed in the course of the work undertaken in Stage 1. These are discussed below.

## **1.3 Functional domains**

Agreement was reached at the Steering Committee meeting of 30 October 2000 that there are 4 domains to be included in the first tier functional screening tool:

- Domestic (instrumental) functioning,
- Self-care (motor) functioning
- Challenging behaviour and
- Cognitive functioning

Carer availability, while closely related, is not in scope for the current project.

Of the 4 domains that are in scope:

- Domestic (instrumental) functioning is also in scope for the second tier assessment.
- Self-care (motor) functioning is also in scope for the second tier assessment.
- Challenging behaviour probably is in scope for the second tier assessment although it was unclear at the time of meeting whether a suitable assessment instrument could be identified.
- Cognitive functioning would probably not be included in the second tier assessment instruments. This issue is discussed further elsewhere.

## **1.4 What is being measured?**

The minimum data set needs to capture:

- Whether the person is capable of performing the task (functional ability). For example, in assessing a client's need for shopping assistance, a measure of functional ability would simply assess the extent to which the person is capable of shopping without taking into account any external factors, AND/OR



- The degree of functional burden that arises because of the person's functional limitations and circumstances. Following through with the previous example, this approach takes into account external factors such as the accessibility of public transport and the physical condition and layout of the house. It assesses the need for assistance with shopping, regardless of whether that assistance is required from a carer, friend or HACC agency.

The level of assistance specifically required from the HACC agency (service need) is not being measured in the current project. Continuing the previous example, this approach would assess the extent to which the person needs assistance with shopping from a HACC agency and would take into account the availability of a carer or friend to assist with the shopping as well as external factors such as accessibility of shops.

Inevitably, in selecting the tools recommended for field testing, trade-offs are necessary in terms of the domains to be measured. For example, the technical properties (particularly reliability) of instruments that capture only functional ability are generally better than those that capture carer burden or service need. Both carer burden and service needs have technical problems (anchor effects) and are influenced by the subjective judgements of raters.

### **1.5 Criteria for including instruments in the technical assessment**

As our review of the literature (see page 17) demonstrates, other trade-offs are between sensitivity and comprehensiveness on the one hand and resource intensity on the other. The key issue is that capturing the full spectrum of ADLs is resource-intensive.

For example:

- Instruments that are sensitive (ie better ability to discriminate) are usually more comprehensive and so more time consuming to use.
- Instruments that are comprehensive often require higher levels of skill to administer or interpret.

Other trade-offs are necessary between the practical administration of an instrument and its reliability. Issues such as the use of observation versus self-report as the basis for ratings and the use of the instrument by raters of various backgrounds and skill levels, will all have an impact on the reliability of the data.

For example:

- Instruments that rely on observation are usually more reliable than those that use report and self-report but are less practical in a community setting.
- Instruments with demonstrated reliability often require standard training or a particular set of professional skills.

In making judgements about the comprehensiveness and sensitivity of the data to be collected, much depends on field testing the ways that the data will be used. The best methods of collecting data will depend on how the data are actually intended to be used.

For example:

- Given the diverse nature of HACC clients, and the HACC sector, it will be necessary to capture both early loss and late-loss Activities of Daily Living (ADLs). This issue is discussed in the

attached literature review. Late-loss ADLs – such as bed mobility, toileting, transferring and eating - are those which older people are likely to lose last in life and are contrasted with early-loss ADLs – such as shopping, ability to use public transport, bathing, personal hygiene and dressing. ADL loss tends to follow a pattern and most individuals with late-loss problems will have already lost their independence in the early-loss ADLs.

Finally, the selection of an instrument is also shaped by choosing one with no costs, with no commercial restrictions on its use and with minimum training requirements. This rules out a range of tools including the FIM, the Pra and the Pac.

## **1.6 Handling diversity – floor and ceiling effects**

Instruments that capture only early loss or late loss ADLs have technical problems in terms of ceiling or floor effects.

For example,

- The Illawarra Coordinated Care Trial demonstrated that, while many clients rated a perfect score (ie hit the ceiling) on self-care measures targeting late-loss ADLs, they still needed HACC services. Likewise, clients would hit the floor on an instrumental measure (ie would be defined as maximum need) but have varying levels of need for HACC services. The instruments measuring early-loss ADLs were not able to discriminate between people at the high-need end.
- These same problems arise when a tool such as the RCS is applied to a diverse population group such as the HACC target group. Ceiling effects arise because most of the RCS measures the late-loss ADLs. Also, tools such as the RCS do not take into account issues such as carer burden or availability.

In consequence, both early loss and late loss ADLs are to be included in both the screening and assessment tools.

## 2 A two tiered approach to assessment

The HACC and aged care sector has significant diversity in the skills and qualifications of service providers. Many of the services include volunteers, and it is not realistic to expect them to apply sophisticated assessment instruments.

On the other hand, some services (eg, most ACATs) already use quite sophisticated assessment instruments and it is not realistic to expect them to discard such tools in favour of one generic tool if the generic tool is less sophisticated than the instruments they are already using.

The key question is how best to deal with the significant range and diversity of consumer needs. Some consumers require only minimum services to allow them to remain independent (for example, assistance with prepared meals and/or housekeeping) while others require intensive community support.

A detailed (and resource intensive) assessment is not necessary for someone who needs only housekeeping or meals, whereas someone requiring intensive community support services should receive a comprehensive needs assessment and systematic review.

Given this diversity, we propose the development of a two tiered problem identification and assessment system. In practice most jurisdictions either have plans, or have already begun implementing, such two tiered systems.

Multidimensional functional assessment has an essential role in the determination of appropriate care for the frail aged, those with disabilities and their carers. However, pre-assessment screening<sup>1</sup> offers a number of advantages for care managers and service providers. Screening helps service professional to quickly, economically and reliably (Maddox and Bratesman 1997):

- decide whether a more comprehensive and costly full-assessment is required, thus conserving and better targeting their resources
- make a well informed referral to other services if appropriate
- Identify clients or carers with urgent needs.

At the first tier, a simple functional screening tool is applied to all current and potential consumers by any service provider, irrespective of their background or qualifications. This requires the identification of screening and trigger items that could be collected on a routine basis. This is not dissimilar to the problem screen included in the CIARR, will be required by the new call centres as they develop and is a logical development as program-level tools come into line with each other.

Modifications to the minimum data sets should ensure that they contain information that provides a standardised mechanism to identify clients who could benefit from further assessment of specific problems, or who are at risk of functional decline.

The results of this initial functional screen would then trigger a more comprehensive assessment for those who require it. This more comprehensive assessment would form the second tier in the assessment process. It would not be provided to all clients but rather only to those clients with identified needs and functional limitations.

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<sup>1</sup> We are yet to find terminology that is acceptable to all stakeholders to label the first tier. The term 'screen' often implies 'eligibility screen', 'basic assessment' is acceptable but can be confused with the second tier assessment, 'initial needs identification' is in use in Victoria and we thought it would be too confusing to adopt the same term here. We have used the term 'functional screen' in this Stage 1 report and will consult with stakeholders in Stage 2 about the best terminology.

These ideas are illustrated in Table 1 below.

**Table 1** *A two-tier model that separates screening and assessment.*

	First tier		Second tier
	Eligibility Screen	Initial functional screen	Functional assessment
Purpose:	Determine whether client is eligible to receive services	To classify each person as low need, medium need and high need with respect to their functional ability.  Only people screened as being of high need (or perhaps also medium need) would receive a more thorough functional assessment	To assess in detail the functional needs of consumers assessed as being in high need (or perhaps also medium need).
Performed on:	All those referred for service	All those accepted as clients.	All clients with problems as identified through problem screen.
Performed by:	Referring agency or HACC agency	Any service provider	Accredited assessor
Performed when:	Prior to being accepted for service	When referred to service	At least yearly or when there is a significant change in the person's functional needs (ie significant enough to necessitate a new package of community care services)
Methods:	Telephone or face to face interview		In-depth interview or examination, generally including home visit
Result:	Accepted or rejected for service	Functional problems identified and high (and medium) need clients referred for more detailed assessment	Determine functional needs and potentially also inform funding level and provision of specific interventions

There are many variations on this model in different States and Territories, but it is consistent with most contemporary practices, which are increasingly being driven by technological changes, including IT development and a proliferation of call centres.

## **2.1** *The recommended functional assessment model*

It is recommended that the functional dependency items be developed on the assumption of a two tiered assessment process. The first tier consists of a simple functional screening. The second tier consists of a more comprehensive assessment for those who require it.

This recommendation is consistent with current plans and practice as summarised below.

## 2.2 **Current plans and practice**

The planning and practice of measuring client dependency in the community is developing quickly, driven by new technologies, improved methods for handling data and reporting performance, and the rapid expansion in automated and electronic communication systems through the current fashion for call centres. These represent multiple solutions to well understood problems (fragmentation, lack of information for consumers, multiple assessments), but also mean duplication of effort and a proliferation of forms capturing largely non-comparable data sets. There are notable exceptions to this general description, and a national and rational framework should be acknowledged as being in place, but the key point is that there is much room for easing rather than increasing data collection burdens and for improvements in what the data can tell us.

The aged and community care sector has a bewildering array of tools in current use. They vary by the purpose and scope of what they seek to measure: client registration and eligibility, screening for service needs, screening and assessment of client needs, client classification, care planning, service planning, resource allocation. They also vary greatly by State and Territory, region and geography, by program funding source, by client type (including diagnosis) and problem (risk) profile, by service type, and by the setting of care. The review tables in Attachment 3 deal mainly with those information systems, projects and tools most relevant to the HACC program and its immediate boundaries.

With so much rapid change, it is fortunate that there is a national structure for handling data and an assessment framework in place as strong reference points. But the new phone-based systems are less well integrated into the framework at present and the new call centres nationally and at state and regional levels, and through specific programs need a means of comparing their clients. Projects like the National Dementia Behaviour Service make use of a phone backup service to help staff develop their strategies for handling problem behaviour in residential care and in respite. The Department of Veterans Affairs has undertaken several relevant initiatives with their new system of HACC-funded Veterans Home Care. They have developed a new rating scale to determine eligibility. Implementation issues are likely to be complex as this work is simultaneously compiling new tools, establishing a regionalised system of designated assessors, and developing an electronic payments system.

At the state level, Victoria has plans to move toward a 2 tiered system and has started constructing a State-wide system on that basis, with plans for training staff. The 1<sup>st</sup> tier is called the 'Initial Needs Identification' out of which arises either a 'Simple Assessment' or a 'Comprehensive Assessment'. The data from this process will be incorporated into the Primary Care MDS in Victoria and be capable of exporting reports to various levels of program administration. WA is trialing something similar to Victoria with their WA Community Care Classification (which builds upon earlier work by Silver Chain). A State-wide project is being used to develop the technical tools – for a telephone screen followed by a comprehensive assessment. NSW has a two-tier model in its multi-departmental assessment framework, currently based on using the CIARR as the first tier. Meanwhile the Home Care Service of NSW has established its own call centre for triage and assessment in metropolitan Sydney. In April 2001, the NSW HCS has been merged with the disability services of the Department of Community Services (which uses a variety of tools not reported in detail here) and the funding department (ADD) to form the Department of Ageing, Disability and Home Care. Many other projects, systems and program specific tools exist in NSW, with potentially a wide scope for applying consistent tools through the coordinating efforts of a high-level human services group. In the ACT planners are proposing an ACT Intake Centre for all of ACT Community Care. This has potentially wide scope, but is not expected to cover the work of the non-government sector. In Tasmania there is a central call centre, and providers use the NSW model of the CIARR and its associated electronic data transfer system and protocols. Services in the Northern Territory mainly use simple modified tools with many local variations to determine service eligibility and plan care. Remote ACATs use the more formal functional scales.

### 3 The initial functional screen

The screening tool needs to be capable of being used as a filtering system. It needs to be suitable for use in all jurisdictions, irrespective of the details of the approach they take to assessment. It therefore needs to be able to be incorporated into IT systems through data sharing protocols such as those established for the CIARR. These data sharing protocols could be trialed in the field testing to be undertaken in Stage 2. For example, it would be sensible to field test the instrument in call centres (such as the Care Link centres, the NSW Home Care Sydney Call Centre, or WACCC) or in a sample of Victorian agencies.

The initial screen should also be useful for direct referrals by and between HACC agencies. This issue needs to be tested in Stage 2.

The Working Group expectation is that the screening tool will be simple (10-15 items maximum), take 10 minutes or less to complete and be administered on everyone.

A range of issues need to be considered in Stage 2. It is still to be resolved if only new clients will be screened or whether there will be periodic screening of those already receiving services. Likewise, the field testing of items should include data sharing protocols between HACC agencies, but it is not yet resolved how this is best field tested in Stage 2.

#### 3.1 *Screening tool: outline of content*

The implication of these decisions by the working group is that the content of the screening tool would look something like this:

Do you/does the person need someone to help (you) with the following tasks:

Personal hygiene such as help going to the toilet?  
 Personal care such as showering?  
 Preparing meals?  
 Housework?  
 Food shopping?  
 Etc

Are you (is the person) able to move about your home without someone to help you?

Do you need help:  
 Walking outside?  
 Getting to the doctor's office?

Several such instruments are in common use but most have been developed locally and few have been subjected to testing of their sensitivity, reliability or validity (see Attachments 3-5 for more information).

#### 3.2 *The recommended functional screening instrument*

No existing functional screening instrument is recommended at this stage. The selection/development of the initial functional screening instrument constitutes a major component of the work to be undertaken in Stage 2.

## 4 The second tier assessment

In this section we discuss each of the four domains, including the potential to map existing measures to each other. We have concluded that different approaches need to be adopted for each of the different domains. Detailed discussion of the key issues is included in the literature review.

### 4.1 Self-care domain

This domain is already commonly captured and different measures are already incorporated in different data sets (FIM in the rehabilitation data set, RUG-ADL in the DVA data set and community nursing data set etc). Mapping the various instruments to each other is a viable alternative to the replacement of these existing tools with one standard instrument. It is technically possible to map tools such as the FIM, Barthel, RUG-ADL and the Katz ADL to each other and to the dependency items in the AGS (ACAT) and the CIARR.

While mapping does have some technical disadvantages, the major advantage of such an approach is its acceptability to HACC providers as the instruments they are already using could continue to be used. This will be particularly important in the development of an integrated national aged and community care assessment framework. Such a framework would cover both HACC and ACAT services and thus a large number of services that are already using a dependency measure of their choice.

Included as Attachment 4 to this report is the mapping work undertaken to illustrate the feasibility of this approach. The Steering Committee showed strong support for a mapping approach. However, their preference is to recommend one preferred instrument. All other instruments then get mapped through to the preferred instrument. The preferred tool could also be recommended to services currently not using any measure.

#### 4.1.1 The recommended self-care functional assessment instrument

It is recommended that the HACC sector approve two self-care assessment instruments – the Barthel Index and the Functional Independence Measure (FIM).

The recommended tool for the sector is the Barthel Index and FIM data can be mapped to the Barthel Index for reporting purposes.

The reasons for selecting the Barthel as the recommended scale are:

- It is widely used
- It has been shown to be valid for different methods of administration
- It is quick to administer
- It is valid for use as 'report' (does not have to be observed)
- It covers the main ADL items in most scales
- It has demonstrated reliability and validity (although this would need to be reviewed for a HACC population).
- The added scores have some meaning. The scale has been shown to be hierarchical (although this would need to be reviewed for a HACC population).
- It has been shown in a number of studies to correlate with the FIM. The items match well, thus facilitating mapping.

## 4.2 Instrumental domain

Domestic functioning is often assessed and reported, however commonly as text rather than by use of a measurement instrument. Tools in use in Australia are dated (eg Lawtons). Newer instruments have been developed (especially in the USA) but are not in common use in Australia. A key issue to be resolved in the development of a new tool is the degree to which it should measure domestic functioning as well as the degree of carer burden. Cultural appropriateness and relevance are an issue in the Australian context, particularly in relation to the ATSI population. Rural/urban differences need to be taken into account because of differences in social infrastructure in different settings. Gender issues might be relevant as well. The development of a new or composite instrument is preferable to a recommendation to adopt an existing instrument. WACCC is using Lawtons but has modified it in their form. They are collecting data on this.

### 4.2.1 The recommended instrumental functional assessment instrument

It is recommended that the HACC sector modify the Lawton's IADL measure (see Attachment 4 for a copy of this measure).

The reasons for selecting the Lawton's as the recommended scale are:

- It was developed for community use
- It is quick to administer
- It covers the main IADL items in most scales
- It would work well with the Barthel (e.g Barthel has stairs, Lawton's IADL does not)
- It seems to be in common use

The reasons it requires modification are:

- It needs to incorporate changes in technology (eg, telephone aids) since the scale was developed
- It needs to be re-scaled to remove the gender differences originally built into the scale
- There are floor effects in some items for the HACC population. For example, the transport item (shown below) makes no provision for scoring consumers who can be safely catered for by specialist workers with advanced training, who require a high level of care and who have a high level of risk associated with their health condition or assistance needs. It simply assumes that such people do not travel
- Some items may not be culturally appropriate

**Table 2** *An example of an item in the Lawton's IADL that requires modification*

Mode of transportation	
1	Travels independently on public transportation or drives own car
2	Arranges own travel via taxi but does not otherwise use public transport
3	Travels on public transportation when assisted or accompanied by another
4	Travel limited to taxi or automobile with assistance of another
5	Does not travel at all



The modification and testing of the Lawton's constitutes a component of the work to be undertaken in Stage 2. This could occur in close collaboration with the WA Community Care Classification project as that work is already testing a modified form of the Lawton's.

### **4.3 Cognitive domain**

Measuring cognitive functioning is often technically complex and can require a degree of judgement (eg client attitude to measurement, cultural difference, effect of medications etc). Most cognitive assessments (as distinct from screening) are undertaken by health professionals with the Mini Mental State Examination (MMSE) most commonly in use. The cognition subscale of the FIM is also commonly used. The MMSE measures functional ability while the FIM subscale measures the carer burden arising from it. Other instruments are also available and in use, for example the Short Orientation-Memory and Concentration Test. There has been little work done to attempt to map the various instruments.

It would seem that the performance of a client on a subset of IADL items is also correlated to cognitive impairment in community residents. A screen derived from 4 questions in the Lawton's IADL scale was developed by Barberger-Gateau et al. (1992) and was reported as having good sensitivity and specificity for detecting dementia. It was less accurate at detecting mild forms of cognitive impairment, but a high specificity meant that the screen would still be useful in ruling out cognitive impairment. Consequently, because an IADL-based test is less likely to cause offence to clients of sound mind, and its performance is also less likely to be affected by a client's education level, it might be an effective tool if the main purpose of measuring cognition is to trigger the referral of a client for a full clinical assessment.

#### **4.3.1 The recommended cognitive assessment instrument**

Assuming that a specific cognitive assessment instrument is required for the HACC MDS, the recommended instrument is the Mini-Mental State Examination (MMSE). This had reportedly good reliability and validity when used on community clients and is in widespread use. It is a brief instrument that can be performed by a non-clinician. However, some training would seem to be necessary. Indeed, while the scale can be administered by a non-clinician, it is suggested that some guidelines are adopted in the use of this scale by different HACC services, such as:

- the administration of this test to trained community nurses;
- staff in other HACC services who suspect a client of cognitive impairment (eg. due to poor performance on many IADL) should refer the client to a community nurse for assessment.

We recommend at this stage that the HACC MDS include an item for the total MMSE score (plus an indication of the version of the MMSE used).

### **4.4 Behaviour**

There are two major groups of instruments that measure aspects of mental status that are not linked to cognitive function. The first are instruments that aim to screen for depression. While depression is not a functional domain, we have included information in the attached literature review to highlight the importance of depression as a cause of functional dependency in the elderly population. A further reason is to suggest that, while it is not in scope for the current project, the introduction of screening for depression might be a logical step at a future time. Identifying depression is important as depression is a condition that can be successfully treated. It might also be associated with behaviour disturbances and/or a general increase in dependency and need for assistance.

The second are instruments that aim to measure challenging behaviour and other behavioural disturbances. In the disability sector as well as in aged care and respite care, the focus on behaviour and especially challenging behaviour, is important in determining levels of service provision and has implications for occupational health and safety issues. However, as the attached literature review highlights, there are few accepted scales that have been subjected to tests of validity and reliability.

The information supplied by various government departments and other agencies were examined to determine what instruments are being used within Australia to measure behaviour. This demonstrated that, while many (ACAT) services were using valid instruments for measuring physical and cognitive function (eg. Barthel and Mini-Mental State Examination respectively), few were using rigorously assessed instruments to measure behaviour. Most appeared to be using a variant of the behaviour questions within the Australian RCS classification. The only named instrument used by a service was the Brief Non-cognitive Symptom Rating (BNSR) scale.

#### **4.4.1 The recommended assessment instrument for challenging behaviour**

The review of the scientific literature and information on locally used scales failed to identify a scale that was in wide use and that had strong evidence of reliability and validity. Therefore, with respect to the hierarchy of preferred approaches, it was not possible to select a published measure to meet the criteria of preferences 1 or 2. The two scales identified from the review that seemed most appropriate (the Ryden Aggression scale and the Dysfunctional Behaviour Rating Instrument) were not judged to be suitable for several reasons:

- the review found little evidence of reliability and validity other than the initial article describing the scale;
- both were designed for use in community dwelling older adults; it was not clear that they would be appropriate for HACC clients and agencies.

This lack of success, while disappointing, is perhaps understandable; there appears to be no gold standard for measuring challenging behaviour at present. Consequently, in view of the fact that the behaviour questions of the RCS scale have been used successfully by ACAT services to measure behaviour, thus suggesting they have (at least face) validity, and are suitable for this population, we propose that this set of questions be tested as the measure of behaviour in the second stage of this project.

This recommendation is seen as preferable (a perhaps “weak” preference 1) over developing a composite measure with items taken from different scales (preference 3). This is because of the limited evidence that any of these “validated” scales would be valid in a community setting. It was also seen as preferable to adopting the one named scale being used by the one ACAT because a search of Medline and PsychLit failed to find any literature on its reliability and validity.

## 5 Implications for Stage 2

The extent of testing required in Stage 2 is determined by the outcomes of the Stage 1 findings.

We propose that the Stage 2 testing consist of the following:

- Field test the common functional screening instrument
- Field test the preferred motor function assessment instrument (the Barthel Index) in those settings where it is not in use;
- Field test the preferred instrumental function assessment instrument (a modified form of the Lawton's) in a variety of settings;
- Field test the preferred cognitive function assessment instrument (the MMSE) in a variety of settings;
- Field test the preferred behaviour instrument (the behaviour items in the RCS modified for use in a community setting) in a variety of settings.

The criteria for selecting field testing sites will involve the views of the States and Territories. Selection will need to consider variables such as geographical location, target group (young/old), size (large/medium/small), staff qualifications and mix including volunteers, client cultural background (ATSI, NESB) and agency culture (especially ATSI agencies).

For testing the screening tool, we need a sample of agencies that will typically participate in screening type activities.

For assessment, only those that will undertake specialist assessments will need to participate in field testing.

Planning for Stage 2 will commence as soon as the recommendations from this Stage 1 report are approved with field testing to occur around March-April 2001.

## Attachment 1: An overview of the HACC target population

The Home and Community program (HACC) provides 'basic care and maintenance services designed to assist in meeting the physical, psychological, daily living, and social needs' of the frail aged and other people with disabilities and their carers (HACC Review Working Group, 1988:2). The program targets persons living in the community whom, in the absence of basic maintenance and support services, are at risk of inappropriate long-term residential care. Within this target group, the program identifies a number of special needs groups – Aborigines and Torres Strait Islanders and people from non-English speaking backgrounds, dementia sufferers and people who are financially disadvantaged.

For statistical purposes, the HACC target population is approximated by the population living in the community and suffering severe or moderately severe handicap, as identified from ABS surveys (e.g. Survey of Disability, Ageing and Carers, 1993).

The HACC user characteristics surveys collected descriptive data about clients of HACC funded services to monitor access of the target and special needs groups (Department of Health 1992). Service providers funded through the HACC program were required to furnish data on a sample of their client base for the survey month. The most recent national survey is from 1997. The survey reports data on a 10-20% sample of HACC recipients from all services returning forms, with a higher proportion of recipients being selected in the Northern Territory and Australian Capital Territory. The profile of the 1997 HACC users of services for Australia (76,958 response forms) is shown in Table 3.

**Table 3** 1997 HACC User Characteristics Survey\*

Characteristic	%
Age:	
0-14	2.3
15-64	17.4
65-79	38.2
80+	42.1
Sex:	
Male	32.6
Female	67.4
Non-English speaking background	13
Aborigines and Torres Strait Islanders	2.4
Need for assistance with:	
Mobility	35.1
Personal care	40.7
House keeping	80.9
Communications	15.2
Behaviour	21.0
Continence	18.9
Service types received:	
Home help	53.4
Personal care	20.4
Home nursing	26.4
Paramedical	13.5
Home respite	10.0
Centre day care services	17.9
Home meals	21.4
Centre meals	5.9
Home maintenance	16.6
Transport services	32.8
other	21.4

\*It is possible that more than one response form was completed for some clients as a result of multiple use of HACC Services.

## Attachment 2: Review of standard assessment instruments

### A2.1 Introduction

Numerous measurement instruments have been devised for use in the assessment of dependency. Many of these scales have been used for primarily in research studies, but some have found their way into health or community services as tools to assist staff assess needs for care and monitoring outcomes (among other things). The large number of scales in existence meant that this review had to be selective. Consequently, it focussed on instruments that were designed to measure two specific aspects of dependency, namely:

1. physical impairment, disability and handicap, as indicated by limitations in activities of daily living; and
2. mental status, as indicated by cognitive impairment and behavioural symptoms.

Yet, even in these two areas of dependency, there were too many scales to be reviewed given the limitations of this study, especially in the area of measuring physical disability and handicap (McDowell and Newell 1996). Consequently, the scope of the review was narrowed in a number of ways. The review was limited to instruments that

- would be applicable to the vast majority of HACC clients;
- were not designed to capture very specific forms of impairment or disability, like severity indices for different diseases;
- are supported by published evidence confirming that they possess good psychometric properties.

As described in Attachment 1, the clients of HACC services are typically people living in the community whom require some level of care and support in performing basic self care or other daily tasks, like home maintenance. In addition, the majority of clients are elderly. In terms of the selection of scales for the review, this meant excluding instruments that had not been demonstrated to work in the people living in the community and instruments designed for specific population groups like children. However, instruments were not excluded from the review if they had been originally designed for use on elderly clients provided that they met two conditions, namely:

- that there was reason to believe that the instrument would be appropriate for clients of all ages; or
- that the instrument captured information of great importance for the care of the elderly. This applied especially in the case of the instruments measuring mental status. It was assumed that such instruments would only be used in appropriate circumstances.

Note however, that almost all development and testing of instruments has occurred in the health sector. Almost no development or testing has occurred in the community sector, either in Australia or elsewhere. As such, there is often a need to modify the language (eg, the term 'patient' is frequently used) and to assess cultural issues (eg, suitability for the Aboriginal and Torres Strait Islander communities).

The review was undertaken using the following databases: Citations in Nursing and Allied Health (CINAHL), Psychology Literature (PsychLit) and the Medical Data Base (Medline). Use was also made of several books of systematic reviews, notably, McDowell and Newell (1996) and Bowling (1991).

## **A2.2 Framework for the reviews of the assessment instruments**

A standard framework was followed in reviewing each assessment instrument. Following accepted procedures (Bowling 1991), this framework included reviewing the psychometric properties of the instrument, the settings in which the instrument could be used, the population for which the instrument was appropriate and acceptable, and how the instrument could be administered. This framework was used for the review of both the instruments measuring physical dependency and mental status.

The practical aspects of this framework are fairly logical, but there are several issues that are worth discussing. The first of these concerns the administration of the measure. Scales may be administered by observation, by interview (either in person or by telephone), or by self-administration. Some require extensive training or special skills of the part of the interviewer. The method of administration will have implications in terms of cost and ease of application. The wide range of services and the varied background of the field workers is an important consideration when selecting an assessment tool for the HACC setting.

Long or complicated assessment tools will be burdensome to those asked to administer them, and tiresome to those being assessed. As such, these tools may be rejected by those in the field, or result in large amounts of missing data. It has been argued that the burden of gathering data is inversely related to the quality of data collected (Wood-Dauphinee et al. 1994)

A final practical consideration, and one very relevant to the Australian situation, is that of language and culture. A considerable number of HACC users are of non-English speaking background, or of Aboriginal and Torres Strait Island descent. Therefore, consideration must be given to the content and wording of any assessment instruments to ensure cultural sensitivity.

However, for clarity, it is probably worth reviewing the fundamentals of assessing the psychometric properties of the instruments. A brief introduction is provided below. Further details on the issues covered can be found in McDowell and Newell (1996).

The discipline of psychometrics is concerned with the ability of human beings to act as a measuring instrument of quantities for which there is no natural (physical) scale. It is related to the area of psychophysics, a discipline that provided the first evidence that people could make accurate numerical estimates of various phenomenon in a consistent manner. Nonetheless, while people have the potential to report accurately and reliably, there is no guarantee that a particular instrument will produce adequate measurements given the numerous factors that might affect the use of the instrument and that might influence its ability to provide unbiased information.

There are various ways in which different instruments measure dependency. As noted above, some rely the subject themselves to report disabilities and/or impairments, with the instrument being used in an interview or as a self-administered questionnaire. Others rely on the opinions of people who know the subject or on the observations of the person administering the instrument. Various issues arise with respect to each approach, including:

- the extent to which the person rating a subject can vary the assessment questions (eg. so that people who might interpret the same question differently are asked equivalent questions)

- the level of training required to use the instrument, eg. so that the wording of questions is strictly adhered to, or so that the user can control for differences between subjects and ask equivalent questions; and
- how the instrument distinguishes between capacity and performance, ie. whether the instrument should capture what subjects are capable of or their actual behaviour.

Another key issue that will affect the performance of the instrument is their construction. Instruments can take a various forms, consisting of either a single question or test, or a series of questions or tests. For those that consist of numerous items, it is useful to distinguish between profiles (or batteries) and indices (or scales). If a measure is constructed as a profile, the responses to the individual items are presented separately. As such, profiles provide a detailed array of information about a subject and are often preferred by clinicians (McDowell and Newell 1996). In contrast, the responses to items in an index or scale are assigned a numerical value and are summed (and maybe weighted) to produce a single rating score. Such indices are necessary where it is necessary to compare a heterogeneous population and make trade-offs. They are commonly used for policy related decision making (among other things). Of course, some profiles can also be used as scores, thus enabling the collected information to be presented in both ways.

The scaling of items is an area in which various issues can arise in the construction of an index. Firstly, many scales have items in which the response is indicated on a scale whose points are ordered in terms of magnitude, eg. "mild", "moderate", "severe". Successive numbers are usually assigned to each of these points, which are then summed to produce the aggregate score. However, such a scale is ordinal in nature and so that distance between each number may not necessarily reflect the difference between points on the scale. Hence, it is not strictly appropriate to combine scores and it may lead to incorrect inferences being drawn or conclusions when values are compared (McDowell and Newell 1996). This limitation has been tackled in some instances, with studies being conducted to produce weights for each point on the scale. Some scales have also been constructed with numbers that are believed to better represent the distance between points, for example, the modified Barthel index (see section of ADL scales).

The second issue relates to the interpretation of the aggregate score. For some scales, various cut-off points are suggested for indicating the presence or absence of a condition/impairment. This is particularly common for scales measuring cognitive function. For other scales, researchers have suggested that different intervals on the scale that supposedly correspond to different levels of dependency. For example, for the Bartel Index, it has been suggested that scores of 0-20 indicate total dependency, 21-60 severe dependency, 61-90 moderate dependency, and 91-100 slight dependency (Shah et al. 1989). However, the means by which such interpretations were made, or the reasons for proposed interpretations, are not always obvious.

The final issue that will be discussed in relation to the psychometric properties of measurement instruments is the assessment of the quality of an indicator. This is usually assessed across two dimensions: validity and reliability.

In simple terms, validity may be defined as the extent to which an instrument measures what it is intended to measure; it is an indication of an instrument's accuracy. In a quantitative sense, this relates to the degree of systematic error or bias contained by the indicator.

Validity can be assessed against a number of criteria (Bowling 1991). Initially, an assessment may begin with consideration of the 'content' validity of an instrument. *Content validity* refers to the comprehensiveness of the instrument, or to how adequately the included questions or tests reflect the aims of the index (McDowell and Newell 1996). One form of this is face validity, which focuses on whether the indicator appears to measure what it claims to. In other words, is the meaning and relevance of the indicator self-evident?

Content validity may be assessed by a panel of experts who critically review the content of the scale (McDowell and Newell 1996). It can also be assessed using statistical techniques, such as factor analysis. Using factor analysis, the extent to which items in an instrument measure one or more common themes can be examined.

Another common method of assessing validity, referred to as *criterion validity*, is to compare the extent to which the instrument correlates with a 'gold standard' (McDowell and Newell 1996). For example, the validity of psychological screening tests can be assessed by comparing their performance with the diagnoses made by clinicians (the gold standard). In the field of functional assessment, there is no accepted 'gold standard' against which an instrument can be compared (Thomas et al. 1998). However, some measures have, through history or longevity, acquired criterion status, with less than ideal reliability and validity (Streiner and Norman 1996). *Predictive validity*, the accuracy with which a measurement predicts a future event, is often considered as an aspect of criterion validity.

As noted above, cut-off points may be defined with respect to the aggregate index score, thereby determining whether the subject is dependent or not. In such cases, criterion validity is reported using two standard terms, namely: sensitivity and specificity. Sensitivity is defined as the ability of an instrument to correctly detect those who are "sick", whereas specificity concerns the ability of a test to correctly detect those who are "well". Sensitivity and specificity both range from 0-1 with instruments with good validity having values close to 1. However, the values are not independent of each other and both values can be influenced by moving the location of the cut-off point.

Where no 'gold standard' exists, evidence for the validity of an instrument may be gathered through a process of construct validation. *Construct validity* refers to the extent to which the measurement correlates to some other attribute by hypothesis or construct (Streiner and Norman 1996). The construct indicates the internal structure of the attribute and the expected relationships of instrument scores to external factors. For example, if on theoretical grounds, dependency should increase with age, then an instrument measuring dependency would have construct validity if it captured this change (Last 1995). Another common approach to testing construct validity is to compare the performance of an instrument to another instrument that measures the same construct. This is often assessed by looking at how well their scores correlate. However, there are problems with this approach (McDowell and Newell, 1996). Few studies declare what levels of correlation are accepted as demonstrating acceptable validity. Moreover, correlation coefficients indicate association between scales but not agreement.

Reliability refers to the extent to which the results obtained by an instrument can be replicated (Last 1995). In quantitative terms, it concerns the degree to which an instrument is affected by random errors (McDowell and Newell 1996).

There are a number of ways in which reliability may be assessed. The first of these is *internal consistency*. Measures of internal consistency look at correlations among all the items in the instrument. If a large number of items are addressing the same underlying dimension, one would expect that the scores on each item would be correlated with other item scores (Streiner and Norman 1996). Guttman's scalogram analysis is a related measure of internal consistency. Guttman's coefficient of reproducibility indicates how closely the overall score for the instrument relates to the precise pattern of a person's responses (McDowell and Newell 1996).

The second way of assessing reliability is to assess the degree to which the instrument is responsive to change in the quantity being measured. Of particular importance here is to ensure that an instrument is not affected by ceiling or floor effects. It should be able to capture changes in subjects with less or greater degrees of dependency as well as those with average levels.

The final important determinant of an instrument's reliability is the consistency with which it can be used. This may be assessed by examining the degree of agreement:



- between different observers (*inter-observer reliability*);
- between observations made by the same rater on different occasions (*intra-observer reliability*); and
- between observations on the client on different occasions separated by some interval of time (*test-retest reliability*) (Streiner and Norman 1996).

The degree of agreement has typically been measured using Pearson or Spearman correlation coefficients. However, as mentioned above, these are a measure of association and not agreement. Correlation coefficients capture some types of mismatch between scores, but miss others, and consequently, may overestimate the true level of reliability (McDowell and Newell 1996).

### **A2.3 The review of instruments measuring physical functional status**

Published instruments for the measurement of physical function and ability to undertake daily living tasks revealed a strong emphasis in the literature on the assessment of older people, with very few papers dealing with assessment of younger people with disabilities. This emphasis was continued in a number of texts that reviewed the measurement of function (McDowell and Newell 1996, Wade 1992). This emphasis on older people may be a reflection of the history of the development of these scales.

Before proceeding, it is worth considering several issues related to validity specifically related to physical function. It is of utmost importance that the instrument covers those domains thought essential. In the case of the HACC population, considerable numbers of clients have problems with personal care, continence, mobility, housekeeping, cognition and behaviour (Ageing and Disability Department 1998), and an assessment scale (or scales) should capture function in these areas. Further, the measurements obtained ought to meaningfully represent the situation of the client. Thus, if an overall score is determined for any particular client, then it is essential that the underlying items can be rightly summed together, to give a total score, which is a true indication of function in the client. Hence, the dimensionality in the scale and the hierarchical nature of the component items are an important concern.

This review reflects much of the current literature in that cognition is treated as a separate construct from physical function. However, it must be recognised that cognitive function has a role to play in functional assessment, as one must 'know how' to perform to be successful in an activity (Knight 2000). This is particularly relevant in terms of instrumental activities of daily living (IADL). An individual is unlikely to be able to perform IADL's such as shopping, cooking or money management without sufficient cognitive competence (Knight 2000).

#### **Scales for Physical Function and Daily Living Tasks**

Published scales for the assessment of physical function and daily living tasks largely consider *activities of daily living* or *instrumental activities of daily living* as separate entities.

- Activities of daily living represent the basic, physical functions, which underlie normal living. These include such activities as toileting, dressing, walking. They are the activities that everyone needs to accomplish daily (although, it could be argued that some may be completed less frequently, for example, bathing) (Wade 1992).

- Instrumental activities of daily living (also known as extended activities of daily living) may be defined as those activities needed for continued community residence (Fillenbaum 1985). Such activities include, for example, shopping, preparing meals, cleaning the house and managing personal finances, reading, and using the telephone (Barer and Nouri 1990)

The original ADL concept was developed by sociologist S.C Katz and colleagues, in 1963, as a systematic method to measure the abilities of frail elderly institutionalised persons (Duke University Center for the Study of Ageing and Human Development ). These ADL activities were considered to be the fundamental abilities required for an independent life and included: eating, continence, getting in-and-out of bed, toileting, dressing and bathing.

Katz noted that these activities formed a hierarchy, with older people losing their abilities in the reverse order to that which they learned them in childhood (Duke University Center for the Study of Ageing and Human Development ).

Several years later, Broughton and Brody formed a new set of measures known as Instrumental (or Extended) Activities of Daily Living. These IADL's were chosen to complement the ADLs as they measured more complex functions, which are lost at an even earlier stage (Duke University Center for the Study of Ageing and Human Development ). Consequently, IADL impairments affect considerably greater numbers of older people than do ADLs. While ADL activities tend to be physical, IADLs combine cognitive aspects as well as physical (Duke University Center for the Study of Ageing and Human Development ).

A number of instruments include both aspects of ADL and IADL. The classification in this review is based upon what appears to be the main focus of the scale.

## ADL Scales

Table 4 lists the ADL scales considered in this review. Clearly there is marked difference between these scales. A number of points for consideration are highlighted below.

- There is variation in the purpose for which the ADL scales were designed. A number were developed for the assessment of stroke (see, for example, the Barthel Index), arthritis (see, for example, the Health Assessment Questionnaire), outcome in the rehabilitation setting (see, for example, the FIM) or for community surveys (see, for example, the OARS). However, many of these scales are used in populations other than that for which they were initially designed.
- ADL measures should represent a client's *actual* performance, not his or her presumed potential ability or performance. ADL assessment may rely on information obtained from direct observation, or indirectly obtained by questioning the client or carer. Some ADL scales have been applied successfully through telephone interview (see, for example, the Barthel Index) or postal questionnaire (see, for example, the Nottingham ten-point Index). Studies on some of the scales indicate that the results obtained are comparable (see, for example, the Barthel Index).
- ADL scales relying on direct observation are necessarily more time consuming to administer.
- Training in the application of any instrument is likely to result in greater consistency of measurement. There is considerable variation in the level of training necessary for the application of the ADL instruments. Scales such as the FIM require specific training, while others (see, for example, the Nottingham ten point index) appear to require no special training.

- There is considerable variation across the scales in terms of the items covered. Table 5 lists ADL scale by content. Some do not include continence (see, for example, the Kenny self-care evaluation), or mobility (see, for example, the Katz), or stair climbing (see, for example, the Nottingham ten-point scale). Others include some simple domestic activities such as making a pot of tea (see, for example, the Northwick Park ADL Index).
- While some scales rate each individual ADL activity (see, for example, the Barthel Index), others group activities (see, for example, the PULSES profile).
- Available measures of reliability and validity for each of the ADL scales are listed in Table 1. However, the results of studies of reliability and validity of the scales are dependent on the population sampled. Thus, results obtained for stroke patients may be very different to those obtained on people with other disorders.
- There are very few studies, which have compared two or more ADL scales (Wade and Collin 1988).

The ADL scales reviewed in Table 4 measure the need for assistance and are therefore helpful in deciding on the ability of the client to live alone and his or her need for additional support (Wade 1992). However, there are a number of limitations with any of the ADL measures, and these limitations must be recognised. They are as follows:

- they do not indicate why the clients fail to achieve tasks;
- they do not assess how the client achieves independence;
- they have definite floor and ceiling effects, thus other scales (such as IADL scales) need to be used when appropriate. Ceiling effects are a particular problem with persons living in the community.

**Table 4**      **Review of ADL instruments**

Scale	<b>Barthel Index</b> (Mahoney and Barthel 1965) (Wade and Collin 1988)	<b>Kenny Self-care evaluation</b> (Schoening et al. 1965) [Shoening, 1968 #24] (Donaldson et al. 1973) (Gresham et al. 1980)
Purpose	To assess personal care and mobility. Originally for patients with paralytic conditions	To estimate ability of client to live at home or in a protected environment. For setting treatment goals and progress evaluation (McDowell and Newell 1996).
Usage	Designed to reflect level of nursing care. Widely used, in clients with and without stroke.	Designed to reflect level of nursing care
Application	By health professionals to lay persons. For use with direct observation, interview, telephone, from medical records. Takes 2 to 5 minutes to administer, or can be self administered in about 10 min.	Must be observed (clinical staff). Self-report is not accepted. 24 page teaching manual available.
Items	Several versions exist: original 10 items; modified 10 items (proposed by (Collin et al. 1988); expanded 15 items (proposed by (Granger and Greer 1979)).	7 self-care activities (bed, transfers, locomotion, dressing, personal hygiene, bowel and bladder, feeding) divided into 17 categories, split into 85 individual steps.
Scoring / Interpretation	Rating usually on the preceding 24-48 hours Weighted to reflect level of nursing care, and social acceptability (McDowell and Newell 1996) Overall score determined by adding individual scores Original score ranged from 0 – 100. Modified scale from 0 – 20 Various interpretations of total score exist eg <=8/20 severe dependence; <=4/20 total dependence or 12/20 considered as the point of moving from dependence to independence (London and Society 1992)	Each step is rated as 'independent', 'requiring assistance', or 'totally dependent'. The steps within each activity are combined to a 5-point scale ranging from completely dependent (0) to completely independent (4). Self-care activity score is determined from the average of each component. Combine activity scores to get total – equal weights reflect nursing care time. Meaning of overall score unclear.
Reliability	<i>10 item version</i> internal consistency coefficients > 0.87 (Shinar et al. 1987) Inter-observer correlation 0.99 (Roy et al. 1988) Different rating methods – self-report, nurse, clinical impressions, physiotherapist gave Kendall's coeff of concordance 0.93 (Collin et al. 1988) Valid hierarchy for stroke patients using a reduced 10-pt scale (Barer and Murphy 1993) . <i>15 item version</i> Test-retest good with severely disabled adults Inter-rater agreement >0.95 (Granger and Greer 1979) Telephone and observation- high correlation (Shinar et al. 1987)	Inter-rater reliability satisfactory for total score (0.67 – 0.74). Locomotor score less reliable (0.42-0.46) (Kerner and Alexander 1981)
Validity	<i>10 item version</i> Factor analysis in stroke patients indicates 2 factors (Wade and Hwer 1987) Evidence for hierarchical structure of scale in stroke patients (Wade and Hwer 1987) Predictive validity – discharge home; length of stay, prognosis & discharge outcome (McDowell and Newell 1996); number of services being received in the community (Poulos 1999) <i>15 item version</i> Correlations between PULSES profile, KATZ, FIM (McDowell and Newell 1996)	Construct validity – tested with Barthel (for stroke patients, kappa coeff 0.42, Spearman's correl 0.73, significant) (Gresham et al. 1980)  Items demonstrated to be hierarchical (McDowell and Newell 1996)
Comments	Collin and Wade's modified version – reordered the original 10 items; clarified instructions; moved from rating capacity to performance. (Collin et al. 1988). This modified version is the form recommended by another review of scales (London and Society 1992) Barthel superior to Kenny and Katz (Granger et al. 1993)	Considers all the self-care abilities to be equally important in terms of nursing care and assigns equal weight to them. Doesn't specifically measure incontinence. The Sister Kenny Institute, Minneapolis has replaced this scale with the FIM (Geoghegan 2000)

### Review of ADL instruments (cont)

Scale	<b>Katz Index of ADL</b> (Katz et al. 1963)	<b>The Functional Independence measure (FIM)</b> (Granger et al. 1986) – Motor component only
Purpose	To measure physical functioning of older people and those with chronic disability resulting from eg stroke and fractured NOF	Looks at burden of care in terms of physical disability. To monitor client progress and outcome of treatment. Regarded as collecting the minimum required for assessment of disability.
Usage	In wide usage. Has been used in cerebral palsy, strokes, MS, paraplegia, quadriplegia, rheumatoid arthritis (Wade 1992)	In wide usage – rehabilitation facilities in USA, Canada, Australia, France, Japan, Sweden, West Germany. Suitable for clients of all ages (adults and children)
Application	Combination of observation and interview	Measures performance rather than capacity. Data can be obtained from observation, client interview (telephone) or medical records (MCD). 1 hour for training. 30 minutes to administer and score. (McDowell and Newell 1996) Physicians, nurses, therapists or layperson. Extensive manual
Items	Six activities – hierarchy has been established	Motor FIM - 13 items, based originally on the Barthel (McDowell and Newell 1996)
Scoring / Interpretation	Over the past 2 weeks - record most dependent level of activity Each activity rated on a three-point scale. Overall performance classified on an 8 point scale which considers the numbers of areas of dependency and their relative importance (rated A through G, and other) or count number of areas of dependence (0 = independent in all 6, 6 = dependent in all).	13 physical items be scored separately from 5 cognitive items. 7 point rating for each activity. 2 levels of independence – complete and modified (delay, safety risk, assistive device). 2 levels of dependence - modified dependence & complete dependence with finer graduations w/i each level. Rasch analysis translates ordinal scale into interval scale.
Reliability	Little evidence available - Inter-rater reliability reasonable (Katz et al. 1963) Guttman analyses – coefficients of scalability of 0.74 to 0.88 (Borsson and Asberg 1984)	Reliability studies undertaken on large samples (McDowell and Newell 1996).
Validity	Construct validity has been demonstrated. Predictive validity – long-term outcomes (Borsson and Asberg 1984), length of hospital stay, mortality (Asberg 1987)	Content validity considered. Rasch analysis indicates motor and cognitive components (McDowell and Newell 1996) Predictive validity – time required to provide help with personal care tasks (not for those with visual impairment) Also place of discharge, presence of coexisting conditions and severity of impairment. Construct validity – correlates with the Barthel 0.84; The Katz, 0.68, the Spitzer's Quality of life Index, 0.45 (McDowell and Newell 1996).
Comments	Floor effect – insensitive to variations in low levels of disability. (Einarsson and Grimby 1990) found assistance to stand up, stand alone and go outdoors not picked up in a study of polio patients. Not as sensitive as the Functional Status Questionnaire. Designed on the basis that functional skills are lost in a specific order, with most complex tasks being lost first. Since mobility, walking and stair climbing were not found to fit into this hierarchy, these were excluded from the scale (Katz et al. 1976). Guttman analysis suggests a cumulative scale. McDowell and Newell suggest caution in accepting this scale (McDowell and Newell 1996).	Based on the Barthel The division into motor and cognitive components is supported by research (Granger et al. 1993)

### Review of ADL instruments (cont)

Scale	<b>The Physical Self Maintenance scale (Lawton and Brody 1969) (6 ADL items only)</b>	<b>Rivermead activities of daily living scale</b> (Whiting and Lincoln 1980) (Lincoln and Edmans 1990)
Purpose	Developed for use with older people in the community or in institutions	Developed for use with stroke patients or head injury patients in a specialist rehabilitation centre
Usage	Based on the concept that activity can be ordered in a hierarchy of complexity Not widely reported but has been used as a component of other instruments e.g. 1975 OARS Multidimensional functional assessment Questionnaire, Lawton's 1982 Multidimensional Assessment Instrument (McDowell and Newell 1996)	Probably not widely used
Application	Observed and self-administered versions. Suitable for a wide range of personnel (Lawton and Brody 1969)	Occupational therapist, observation
Items	Six items	ADL (first part) and IADL (second part) 16 self-care activities 15 household activities
Scoring / Interpretation	5 point rating scale going from total independence to total dependence. 2 scoring methods – a count of the number of items on which any dependence is found; summing from 6 to 30.	In the original version there were 3 levels – independent, verbal assist and dependent. In new version (1990), only two levels – 1 is independent, 0 is needs help.
Reliability	Inter-rater reliability (Pearson's correlation coeff 0.87 – 0.91) (Lawton and Brody 1969) Six items fall on Guttman scale when cutting point set between independent and any dependency (order: ambulation, grooming, bathing, dressing, toilet, feeding). Guttman reproducibility coefficient 0.96) (Lawton and Brody 1969).	Inter-observer reliability (Whiting and Lincoln 1980) Test-retest reliability (Whiting and Lincoln 1980)
Validity	Has been tested on institutionalised and community dwelling elderly. Some evidence eg correlates well with physician's rating of functional health Correlations demonstrated with other measures of physical function (construct validity) (Lawton and Brody 1969)	Valid for stroke (Whiting and Lincoln 1980) 1990 Revised version - household scale validated as a unidimensional Guttman scale Self care section shown to be valid for stroke (Whiting and Lincoln 1980)
Comments		Shown to be hierarchical with stroke patients, but recent evidence shows that this hierarchy may change (Wade 1992) Does not include continence, which is a great cause of stress. Recommend the revised 1990 version used (Lincoln and Edmans 1990)

### Review of ADL instruments (cont)

Scale	<b>The Functional Status Rating System</b> (Forer 1981)	<b>The Nottingham Ten-point Index</b> (Ebrahim et al. 1985)
Purpose	To estimate the assistance required by rehabilitation patients	Designed originally for use with stroke patients
Usage	To determine hospital usage treatment outcomes. Doesn't appear to be widely used Broader then just ADL	Doesn't appear to be widely used ADL (but does include making a hot drink)
Application	15 – 20 minutes Team member Instructional manual available	Very simple to use
Items	30 items cover 5 topics: self care, mobility, communication, psychosocial adjustment, cognitive function Self care and mobility- totally dependent to independent Others- severe to no impairment	10 items, 9 of which are straight ADL, 1 of which may be considered IADL 0 for dependent 1 for independent
Scoring / Interpretation	Item scores are averaged to form scores on each of the 5 sections.	Total individual scores Postal use also
Reliability	Inter-rater agreement high in a preliminary version of the scales –0.81-0.92(Forer and Miller 1980)	Reported by (Wade 1992) as showing reliability.
Validity	Predictive validity with bladder management scores and cognition predicting eventual placement of patient (Forer and Miller 1980)	Forms a valid hierarchy with stroke patients (Wade 1992), (Barer and Murphy 1993)
Comments	Broad scope. Aspects of this scale have been incorporated into the FIM (McDowell and Newell ) Limited tests on reliability and validity	A valid hierarchy with stroke patients Doesn't include measure of continence Includes an activity usually considered domestic Has no published guidelines, but use those of Rivermead Index (Wade 1992)

## Review of ADL instruments (cont)

Scale	<b>Health Assessment Questionnaire</b> (ADL Component only) (Fries et al. 1980)	<b>The Northwick Park ADL Index</b> (Smith et al. 1981) (Benjamin 1976)
Purpose	Originally designed for the clinical assessment of adult arthritics, but has been used more widely	Developed for use in a RCT on therapy following stroke
Usage	Widely used. ADL (has other domain for pain and discomfort)	ADL and some IADL (preparation of tea, cooking and mobility outdoors)
Application	Self-administered, telephone or interview. 5 – 8 min to complete, scored in one.	Doesn't appear to be widely used Observation
Items	Disability dimension has 20 questions on daily function for past week – covering 8 component areas: dressing and grooming, arising, eating, walking, hygiene, reach, grip and outdoor activities.  Measures aids and appliances used.	17 items
Scoring / Interpretation	Question scores can be combined to form component and dimension scores. 4-point scale from “without difficulty” to “unable to do”. Highest score in each of the 8 components is added, then divided by 8 to provide a score – functional disability index 0 – 0.5 = completely self sufficient 0.5 – 1.25 = reasonably self sufficient, some minor or major ADL problems; 1.25 – 2.0 still self sufficient but major problems with ADL; 2.0 – 3.0 severely handicapped	17 (good) to 55 (bad) or an alternative scoring system where 0 (bad) to 34 (good) (Wade and Collin 1988) Looks at total independence, partial independence, total dependence
Reliability	Interview and self administered versions of disability scale show reliability (spearman = 0.85 for disability index) (Fries et al. 1980) Test-retest reliability good (0.98) e.g. (Fries et al. 1980). Self-administered and observation - good (Fries et al. 1980)	Unable to ascertain
Validity	Predicts health service utilization, clinical progression and mortality (McDowell and Newell 1996)	Unable to ascertain
Comments	Copyright Stanford Arthritis Centre. Concentrates on the disability and discomfort dimensions.  Its role in non-arthritics is unknown. Some of the questions are specific to people with joint disease, but most would apply to people with neurological disease  Fries argued against combining dimension scores to give overall scores.	Making a pot of tea – not culturally appropriate for all clients



### Review of ADL instruments (cont)

Scale	<b>The Pulses Profile</b> [Revised version by (Granger and Greer 1979)]	<b>OARS Multidimensional Functional Assessment Questionnaire – ADL/IADL section only</b>
Purpose	Designed to assess function in aged and disabled people.	A questionnaire designed to assess overall functional status and service use of adults
Usage	To predict rehabilitation potential, to evaluate progress and to assist in program planning	The questionnaire has 2 parts: Part A – 5 dimensions of function – social resources, economic resources, mental health, physical health, ability to undertake Activities of Daily Living; Part B-services. The ADL/IADL section appears in part A. [Development, 2000 #64]
Application	Medical records, interviews, observation (Granger and Greer 1979)	Trained interviewer undertakes personal interview with subject or informant Users manual and training package available Interviewer does not require advanced or professional education Application time for entire OMFAQ is 45 min [Development, 2000 #64]
Items	P=physical condition U=upper limb function L=lower limb function S=sensory components (speech, vision, hearing) E=excretory functions S=mental and emotional status	7 ADL items (referred to as PADL) 7 IADL items Drawn from existing scales (sources noted in manual)
Scoring / Interpretation	4 levels of impairment for 6 components. Some argument about whether the score should be added up or given individually. Can be used to give an overall score from 6 (unimpaired independence) to 24 (full dependence). Granger suggests that 12+ indicates more marked disability; 16+ indicates severe disability	Scored as a rating scale. Also computer assigned scores available. Rater summarises the score for each dimension on a 6 point scale : 1=level of functioning excellent, 6 = level of functioning totally impaired [Development, 2000 #64]
Reliability	Test-retest reliability (0.87) Inter-rater reliability (exceeds 0.95) (Granger and Greer 1979)	Test retest correlations 0.82 for ADL; 0.71 for IADL (Fillenbaum and Smyer 1981) Inter-rater reliability (0.67-0.87) (Fillenbaum and Smyer 1981) Intra-rater reliability (0.80) (Fillenbaum and Smyer 1981)
Validity	Found to reflect changes between admission and discharge for severely disabled adults Discharge scores reflected place of discharge PULSES and Barthel correlated (Pearson's correlation coefficient $-0.74 - -0.80$ , $p<0.001$ ) (Granger and Greer 1979)	Intra-class (Cronbach's alpha 0.86) Valid against other measures eg personal interview by geropsychiatrists (Fillenbaum and Smyer 1981) Factor analysis (on random community samples) of OMFAQ/IADL indicates more than one dimension (Fillenbaum 1985) Reduced OMFAQ/IADL (5 items) constitute a Guttman scale (Fillenbaum 1985)
Comments	Broader than the Barthel, tapping communication, social and mental function.	Application for permission to use may be requested from the Duke University. If permission is granted, the OARS may be reproduced and used without charge (Fillenbaum 2000)

**Table 5**      **Content of ADL instruments\*\***

Item	Scale											
	BI	Kenny	Katz#	FIM	PSMS#	River	FSR	Notting	Health	North	Pulses#	OARS
Bowels *	+		+	+	+					+	+	+
Bladder *	+		+	+	+					+	+	+
Grooming	+	+		+	+	+	+	+	+	+	+	+
Toilet use	+	+	+	+	+	+	+	+	+	+	+	
Feeding	+	+	+	+	+	+	+	+	+	+	+	+
Transfer	+	+	+	+	+	+	+	+	+	+	+	+
Mobility	+	+		+	+	+	+	+	+	+	+	+
Dressing	+	+	+	+	+	+	+	+	+	+	+	+
Stairs	+	+		+			+			+	+	
Bathing	+	+	+	+	+	+	+	+	+	+	+	+
Additional				Communication Cognition		Household activities eg hot drink, money, housework	Communication Psychosocial adjustment Cognitive function	Make hot drink	Grip- door Grip- jar Grip- tap Shopping Car housework	Make cup of tea Use taps cooking	Physical condition Communication support	

\*Bowel and bladder refers to continence # Some ADL functions are combined in this scale

\*\*Presents a summary only. For exact content refer to scale.

BI – Barthel Index

Kenny – The Kenny Self-care Evaluation

Katz – Katz Activities of Daily Living Index

FIM – Function Independence Measure

PSMS – The Physical Self Maintenance Scale

River – The Rivermead Activities of Daily Living Scales

FSR – The Functional Status Rating System

Notting – Nottingham Ten-Point ADL Index

Health – Health Assessment Questionnaire

North – The Northwick Park Index of Independence in ADL

Pulses – The Pulses Profile

Oars – OARS Multidimensional Profile

## **IADL Scales**

Table 6 lists the IADL scales considered in this review. There are considerably fewer IADL scales in existence than ADL scales, but there is considerably more variation in the content of these scales than there is in ADL scales. A number of points for consideration are highlighted below.

- There is variation in the purpose for which the IADL scales were designed. A number were developed for the assessment of stroke patients (see, for example, the Frenchay Activities Index), for institutionalised patients (see, for example, the Lawton's Instrumental Activities of Daily Living), or for community surveys (see, for example, the Functional Status Questionnaire).
- Information on IADL may be obtained by observation (see, for example, The Rapid Disability Rating Scale-2), by interview of carer or client (see, for example, the Functional Activities Questionnaire) or by postal questionnaire (see, for example, the Nottingham Extended Activities of Daily Living Index).
- Training in the application of any instrument is likely to result in greater consistency of measurement. There is considerable variation in the level of training necessary for the application of the IADL instruments. Scales such as the OARS/IADL require specific training, while others (see, for example, the Nottingham Extended Activities of Daily Living Index) appear to require no special training.
- There is considerable variation across the scales in terms of the items covered. Research reveals that there is no consensus for a clear definition of IADL (Chong 1995). Table 7 lists IADL scale by content.
- Available measures of reliability and validity are listed by source for each of the IADL scales. As with ADL scales, reliability and validity studies are dependent on the population sampled.
- There are very few studies, which have compared two or more IADL scales.

There are a number of limitations with any of the IADL measures that must be recognised. These limitations are as follows:

- they do not indicate why the clients fail to achieve tasks;
- they do not assess how the client achieves independence.

**Table 6**      **Review of IADL instruments**

Scale	<b>Frenchay Activities Index</b> (Holbrook and Skilbeck 1983)	<b>Nottingham Extended ADL Index</b> (Nouri and Lincoln 1987)
Purpose	For measuring disability and handicap in stroke patients	To assess the ability of stroke patients to undertake more complex activities (IADL) after they return home from hospital.
Usage	IADL – domestic, leisure, social activities and work	A well known scale which has been used in conditions other than stroke.
Application	Patient interview or mailed questionnaire Few minutes only to complete In the last 3 months and In the last 6 months	Has been used as a postal questionnaire – therefore self-report, based on level of activity actually performed
Items	Does not categorise IADL items into different domains	Four sections: mobility, kitchen, domestic, leisure. Incorporates 22 activities. Each section has been shown to form a unidimensional hierarchical scale with stroke patients (Wade 1992).
Scoring / Interpretation	No ceiling effect apparent for stroke patients (Schuling et al. 1993). Total score obtained by adding 13 items.	Some support for adding the scores of the individual sections (Lincoln and Gladman 1992). Collapse 4-point scale into 0,1. Some have suggested keeping the 4 points i.e. 0 - 3 (Wade 1992)
Reliability	Research suggests the reliability of the scale could be improved for stroke patients and the elderly by deleting two items and creating two subscales: domestic (items 1–5) and outdoor (6,8,10,13,14) activities (Schuling et al. 1993)	Test re-test reliability – for individual questions was good to excellent, except Q2,3 in domestic section (Nouri and Lincoln 1987)
Validity	Construct validity supported by correlations between BI and Sickness Impact Profile (Schuling et al. 1993) Principal component analysis suggests two traits: instrumental disability and some aspects of handicap (items 7 & 9) (Schuling et al. 1993) Discriminates between pre and post stroke functioning (Schuling et al. 1993)	For stroke patients: Valid estimate of functional independence after discharge from hospital (Lincoln and Gladman 1992) Construct validity with BI, Nottingham Health Profile, Geriatric Depression Score, London Stroke Satisfaction Score (Gompertz et al. 1994) Discriminates between clients at home and in institutions. Death or institutionalisation over a 6/12 period unlikely in those with high scores; for clients at home, those with low scores were more likely to receive services. (Gladman et al. 1993) A community study of elderly persons found overall scores predictive of number of community services (Poulos 1999) Validity (hierarchy) of items questioned for depressed stroke patients (Towle 1988) Discriminates between normal older people and those with chronic airflow limitation (Yohannes et al. 1998)
Comments	Looks at frequency of activities, rather than assistance required.	No published guidelines Several publications. Has been used by at least 2 ACATS in UNSW

### Review of IADL instruments (cont)

Scale	The Functional Activities Questionnaire ( <b>Pfeffer 1982</b> )	<b>Lawton's Instrumental Activities of Daily Living Scale</b> (Lawton and Brody 1969)
Purpose	Screening tool for use in community surveys of older people (Pfeffer 1982)	Developed for older people in the community or in institutions – variety of subjects
Usage	To assess independence in IADL Emphasises 'higher level' activities	Seems to be quite widely used
Application	Completed by a lay informant (not self-administered)	By interview (trained) – family, subject, institution etc 5 minutes (Burns et al. 1999)
Items	10 IADL items 1984 version adds 4 ADL items	8 items
Scoring / Interpretation	4 levels for each activity ranging from dependent (0) to independent (3). Activities not normally undertaken are scored (0) if could be undertaken, (1) if could not be undertaken Total scores with higher scores reflecting greater dependency	Scoring as per ADL measure Table 1 Total scores with higher scores reflecting greater dependency
Reliability	Item-total correlations >0.8 (Pfeffer 1982)	Inter-rater reliability (0.85) (Lawton and Brody 1969)
Validity	Evidence of correlation with IADL (Lawton & Brody) ; tests of mental functioning; neurologist's global rating (Pfeffer 1982)	Correlations demonstrated with other measures of physical function (construct validity) (Lawton and Brody 1969)
Comments	Appears superior to the Lawton & Brody IADL scale (McDowell and Newell 1996)	Food preparation, laundry and housekeeping do not scale for men (so 5 point scale for men, an 8 point scale for women) (Lawton and Brody 1969).

### Review of IADL instruments (cont)

Scale	<b>Rapid Disability Rating Scale 2 (RDRS-2)</b> (Linn and Linn 1982)
Purpose	Developed as a research tool to summarise the functional abilities and mental status of older clients in institutions or the community
Usage	Research.
Application	Observation (not self-report) by person familiar with client. 2 min to complete after observation.
Items	18 questions: 8 on ADL; 3 on sensory capacity; 3 on mental capacity; one each on diet, continence, medication and confinement to bed.
Scoring / Interpretation	4 levels for each activity items are equally weighted Use total scores from 18 (independent) to 72 (most dependent) <i>or</i> 3 sub-scores for ADL, physical disabilities and psychosocial problems.
Reliability	Inter-rater (RDRS-1) Kendall's index 0.91 (Linn 1967) Test-retest (RDRS-1) >0.8 (Linn 1967) Item correlations 0.62-0.98 (Linn and Linn 1982)
Validity	3 factors identified on factor analysis (Linn and Linn 1982) - assistance with ADL, degree of disability, degree of special problems. Predictive validity evidenced for mortality (Linn and Linn 1982) Correlation with physicians ratings – low (0.27) (Linn and Linn 1982)
Comments	A broad scale, however without much detail for IADL activities.

**Table 7**      **Content of IADL instruments\***

Items	Scale						
	Frenchay	Notting- ham	FAQ	Lawton's	Rapid#	River- mead	OARS
Feeding		+			+		
Prepare meals	+	+	+	+		+	+
Make hot drink		+	+			+	
Medications			+	+	+		+
Washing up	+	+					
Washing Clothes	+	+		+		+	
Light Housework	+	+		+		+	+
Heavy Housework	+	+		+		+	+
Shopping	+	+	+	+		+	+
Social Occasions	+	+					
Public transport	+	+	+	+		+	+
Walking Outside	+	+			+		
Stairs		+					
Hobby	+		+				
Driving	+	+	+	+		+	+
Outings	+						
Money Management		+	+	+	+	+	+
Tax, business			+				
Current Affairs			+				
Gardening	+	+					
Maintenance	+						
Reading	+	+					
Writing		+					
Telephone		+		+			+
Work							

\* Presents a summary only. Each item covered may not be covered as an individual question, but may be part of a more general question. For exact content refer to scale.

# has a number of different activities which do not fit into this table eg ADL, special problems and degree of disability

Frenchay – Frenchay Activities of

Nottingham – Nottingham Extended ADL Index

FAQ – Functional Activities Questionnaire

Lawton's – Instrumental Activities of Daily Living Scale

Rapid – Rapid Disability Rating Scale

Rivermead – Rivermead Activities of Daily Living

OARS – OARS Multidimensional Functional Assessment Questionnaire

## **A2.4 The review of instruments measuring mental status**

### **Introduction**

The mental status of clients can further affect their level of dependency and need for assistance. There are various instruments can measure different aspects of mental status. Those that are reviewed here can be categorised into two main groups:

- measures of cognitive function;
- measures of behaviour and mood.

There are other dimensions to mental status, but overall, these two groups cover those aspects of mental status that are likely to affect dependency. There is one exception to this, and that is the degree to which someone can communicate. This focuses on the extent to which hearing, speech and vision disabilities affect the ability of someone to make themselves understood or to understand someone else. Interestingly, it would appear that items measuring communication are not included in the mental status tests nor are they a feature in many physical scales. The exceptions are those scales, like the FIM, that include some “cognitive” items. However, data items have been defined and included in various minimum data sets to measure the communication ability of clients, notably the USA MDS for nursing home residents. These items appear to be valid and reliable. Consequently, this might be an approach for the inclusion of these items in the HACC MDS.

### **Scales of cognitive function**

The design of instruments to measure cognitive function is not easy as problems of cognition can cover a broad spectrum of symptoms, from a mild decline in some areas of function like memory, concentration and reasoning, to severe disorders like dementia. In Dementia, memory loss is a central feature, but there can also be limitations in the cognitive functions of language, purposeful movements, or recognition. In addition, an instrument should ideally differentiate between forms of dementia and other conditions that could produce similar symptoms like depression and delirium or other acute states of confusion.

This review focuses on neuro-psychological tests; in particular, it includes instruments that can be used to screen for cognitive impairment, or to assess cognitive performance. These typically evaluate a limited range of cognitive functions, thereby giving just an overview of a subject's cognitive status. The instruments are only capable of indicating of the presence of some impairment (McDowell and Newell, 1996). Accordingly, clinical assessment will remain essential to evaluating the mental status of individual clients. Most tests include:

- assessment of orientation in time and place;
- concentration and attention tests;
- tests of short- and long-term memory.

The design of the instruments differs from those measuring aspects of physical function. The scales are typically not hierarchical. The data of individual items also has little independent meaning. Generally, the scores associated with the correct answers for individual items are simply summed to produce an aggregate score. This is interpreted either in relation to a cut-off point that determines either the presence or absence of cognitive impairment, or in relation to an ordered ranking of levels of impairment, eg. from normal to severely cognitively impaired.



Table 8 lists the measures of cognitive function considered in this review. From this table, a number of differences between the scales can be recognised. A number of points for consideration are highlighted below:

- The purpose for which the cognitive scales were designed share a number of similarities, notably a focus on determining the degree of deterioration in dementia clients. They were often designed for use with elderly clients either in hospital or in nursing homes. They were then used, or adapted for use, with elderly people living in the community. Some of the adapted scales were a shortened version of a longer scale, such as the Short Portable Mental Status Questionnaire, while others adapted items so that they could be administered in the community setting, eg. Short Mental Status Questionnaire.
- The instruments in which subjects were asked questions directly naturally reported the performance of a subject at that time. Only the Dementia Scale, which relied on information from informants requested retrospective information (behaviour over past 6 months). Interestingly, in this scale, it appears that there was no instruction on whether this behaviour is average or the worst observed.
- None of the scales included in the review took very long to administer. However, only one (the Mini-Mental State Examination) explicitly stated that it could be administered by a non-clinician with brief training. It is unclear how many of the others could be administered by non-clinicians.
- It was often unclear what training would be required. Brief training was explicitly required for a few scales, and given the similarity of the scales, it would seem reasonable to infer that a clinician using the others would need some as well. Training would seem to be necessary for two key reasons. First, it would improve the reliability of the instruments. Second, the interpretation of the scores is not necessarily straight forward.
- Considering the items covered by the scales seems to identify two categories of test (see Table 9). The first are short tests that cover the dimensions of orientation, memory and concentration. The second are more comprehensive tests that cover most of the dimensions considered to fall under cognition. The two exceptions are the Clock Drawing test and the Dementia Scale. The latter covers some cognitive dimensions, but also includes items on how well the subject can perform activities of daily living and instrumental daily activities, as well as items related to their behaviour and mood. This is probably a reflection of the scale being designed for use with informants rather than an interview with the subject themselves. Indeed, another scale for use with informants (the Informant Questionnaire on Cognitive Decline in the Elderly, IQCODE) includes similar items.
- The process of interpreting the scores of the instruments were generally similar. Typically, the score is interpreted against some threshold that determines whether the subject is cognitively impaired or not. This then leads to a further examination. None are sufficient to lead to a diagnosis of dementia on their own. In a few cases, the scores were interpreted in terms of level of impairment, though it is unclear whether this approach was as accurate as the former. The scores of each instrument seemed to be influenced by factors other than cognitive behaviour, notably education level.
- The reliability and validity of the instruments were all moderate or above. The Mini-Mental State Examination had been the most extensively evaluated, and existed in some modified forms that were supposed to improve its already good performance. It seems to be the de facto “gold standard” in studies that compare the scores of different scales.

There are a number of limitations in the use of these scales to assess dependency for HACC clients. For most, there is not an obvious way to translate a rating of impairment to level of

assistance needed. The scales that function as identifying whether or not a person has an impairment are only signalling the need for further assessment. In this respect, the Dementia Scale would seem to be the most useful as it directly asks how limitations in cognition have resulted in decline in independence.

Second, there are doubts about their suitability for clients living in the community. Most cognitive screening instruments are reported as missing mild and moderate impairments, including the Mini Mental State Examination (McDowell and Newell 1996). Moreover, the HACC program cares for a significant number of people who are unlikely to suffer from the disorders or conditions being screened for by these tests. It has been noted that using cognitive tests as case-finding tools is difficult as the very administration of a test may be demeaning to a person (Juva et al. 1997).

Third, as noted above, educational level can affect the scores of the items. Some have tackled this issue by suggesting different thresholds for different education levels, but it is not clear that reference baselines should be transferred between locations.

There may be an alternative to using a cognitive test to assess mental status. It has been found that the performance of a client on a subset of IADL items is also correlated to cognitive impairment in community residents. Specifically, a screen derived from 4 questions in the Lawton's IADL scale (telephone use, use of transportation, responsibility for medication intake, and handling finances) was reported as having sensitivity and specificity of 0.77 and 0.94 in detecting dementia (Barberger-Gateau et al. 1992). However, it was less accurate at detecting mild forms of cognitive impairment. The sensitivity and specificity of the screen (cut-off = >1 problems) for MMSE scores of less than 24 was 0.37 and 0.94 respectively. Nonetheless, the fact that specificity remained high means that the screen would still be useful in ruling out cognitive impairment.

The use of an IADL derived screen has some notable benefits. As well as being less likely to cause offence to clients of sound mind, Barberger-Gateau et al. also noted that IADL performance was less likely to be affected by education level. If the selected cognition scale is simply to be used to trigger the referral of a client for a full clinical assessment, it might be the preferable choice.

**Table 8**      **Review of cognitive function instruments**

Scale	The cognitive capacity screening examination (CCSE) (Jacobs et al. 1977)	The clock drawing test Various authors from 1986 (McDowell et al. 1996)
Purpose	Designed to assist clinician's in identifying organic mental syndromes, particularly delirium among medical patients	A tool to test cognitive function specifically deficits in visual-spatial abilities and abstract thinking. Recently, proposed as a screening test for dementia.
Usage	On elderly hospitalised medical patients. Tested in neuro-surgical population. Seems used mostly in the USA.	Widely used on elderly people in various clinical and hospital settings
Application	Administered in interview with subjects by doctors or nurses or other trained professionals. Takes 5-15 minutes to complete. Some training would seem necessary	Self completion. Takes a short amount of time.
Items	30 items covering judgement, mental speed, sustained effort. Based on idea that mental syndromes can be identified by requiring the subject to shift rapidly from one task to another, often with interposed distracting tasks.	1 item. Subjects draw hands on a dial clock face.
Scoring / Interpretation	Subjects rated on how they respond to questions, with 1 mark for each correct answer. The overall score counts the number of correct answers. Recommended cut-off point = 19/20.	Various scoring mechanisms have been proposed for: clock drawing, clock setting, clock reading. Qualitative examination can also distinguish between different diagnoses where quantitative scores do not. (McDowell et al. 1996)
Reliability	Internal consistency alpha = 0.97 (Foreman 1987) Inter-rater reliability: initial tests should complete agreement on a small sample. Later tests on 50 patients found correlation = 0.92 (Beresford et al. 1985) Sensitivity to change: unclear	Inter-rater reliability was been reported as good for various methods (Ainslie et al. 1993; McDowell et al. 1996) Test-retest reliability was also reported as high, rho =0.70-0.76 (Tuokko et al 1992; Watson et al. 1993)
Validity	Initial sensitivity and specificity reported as 94% and 71% respectively. Others have reported sens. and spec. as 62% and 90% respectively (Kaufman et al. 1979) and 84% and 94% (Beresford et al. 1985). Reported correlation with other scales: 0.63 with short portable Mental status questionnaire, 0.83 with Dementia rating scale and 0.88 with the Mini-Mental State Examination (Foreman 1987)	Typical reported values for sensitivity and specificity have been reported between 75-92% and 97-82% respectively (McDowell et al. 1996). Correlation of clock drawing scores with other scales: 0.56 with the Global deterioration scale, 0.51 with Blessed Dementia rating scale, and 0.59 with the short portable mental status questionnaire (Sutherland et al. 1989).
Comments	Responses affected by language comprehension. Tasks are comparatively undemanding and may fail to detect mild impairments. Little is known about its performance in the community.	Scoring appears to be affected by educational level, and is unsuitable for people with visual impairments. Need for standard set of instructions to be developed if it is to become a screening test for use by a primary care physician (Ainslie et al. 1993). Unlikely to suffice as a screen for dementia (McDowell et al. 1996).

## Review of cognitive instruments (cont)

Scale	Information-Memory-Concentration (IMC) test (Blessed et al. 1968)	The Dementia Scale (Blessed et al. 1968)
Purpose	The IMC test provides a quantitative estimate of the degree of intellectual and personality deterioration in senile dementia. It is three parts of the "Blessed Test" assessment scale.	Developed as a research tool to quantify the cognitive and behavioural symptoms typically seen in patients with dementia.
Usage	With clients with senile dementia. Widely used in clinical practice and the community	Originally used in studies linking manifestations of dementia with neuro-pathological findings in the brain. Typically with elderly clients. Not used extensively.
Application	Clinical interview with client. Personal information must also be obtained to check the accuracy of the client's report. Approx time to complete = 10 minutes. Unclear what training is required	Interview with relatives or friends by clinician. Unclear how long it takes to complete, nor training required.  Scoring based on actual behaviour. Subject is rated on behaviour over the past 6 months.
Items	29 items in complete test: 14-items in information, 12-items in memory, and 3 items in concentration.	22 items, 11 in cognitive sub-scale. Measures: (1) changes in performance of everyday activities (8 items); (2) changes in self-care habits (3 items); and (3) changes in personality, interests and drives (11 items). (1) and (2) form the cognitive sub-scale.
Scoring / Interpretation	Originally, each correct response positively scored, with overall score ranges from 0-37, but many authors now count errors (McDowell et al. 1996). Some ranges suggested: eg. scores 0-8 errors (normal or minimal impairment), 9-19 (moderate impairment) 20 or more errors (severe impairment) (Katzman et al. 1983)	Scores for each item are summed to give a total score, range 0 (normal) to 28 (extreme incapacity). Cognitive sub-scale ranges from 0 (normal) to 17 (severely demented).
Reliability	In nursing home patients, internal consistency alpha reported as 0.93, and test-retest reliability 0.88 (Leshner et al. 1986) Reliability reported as slightly better the Mini-Mental state exam (Thal et al. 1986)	Inter-rater reliability: correlation for two rates was reported as $r=0.59$ (Cole 1990)
Validity	When scores compared to pathological/autopsy findings, found to have reasonable predictive validity; correlation with count of senile plaques and other path variables = approx 0.60 (Blessed 1968; Katzman et al. 1983) Reported as having high correlation with mini-mental state scale (Fillenbaum et al. 1987), clinical dementia rating scale (Davis et al. 1983) and mental status questionnaire (Katzman et al. 1983).	When compared to autopsy findings, scores found to correlate with count of senile plaques ( $r=0.77$ ) (Blessed et al. 1968). Scores reported as differing between clients with Alzheimer's disease and other dementia (McDowell et al. 1996). Scores for deterioration of personality sub-scale reported as being neither sensitive nor specific for dementia (McDowell et al. 1996). Reported as having high correlation ( $r=0.80$ ) with the Clinical Dementia Rating scale (Davis et al. 1990).
Comments	Also known as the Blessed test, the Newcastle Memory, information and concentration test. Sometimes only two of the three scales are used, as in the information-concentration test. Some questions are culturally dependent, eg. name prime minister, but alternatives suggested. A six-item short form exists that correlated highly with the complete test and with the clinical dementia rating and mini-mental state exam. (Fillenbaum et al. 1987) Frequently used as screening tests for dementia. Provides a good overall estimate of intellectual functioning. Content is simple and focuses on practical tasks of daily life.	Also known as the Blessed-Roth Dementia scale, the Newcastle dementia scale, or the Blessed Dementia rating scale. Has been incorporated into the CAMDEX scale.

## Review of cognitive impairment instruments (cont)

Scale	<b>The Short Portable Mental Status Questionnaire (SPMSQ)</b> (Pfeiffer 1975)	<b>Mini-Mental State Examination (MMSE)</b> (Folstein et al. 1975)
Purpose	To offer a rapid screen for cognitive deficit in the community dwelling elderly. It detects organic intellectual impairment and determines its degree	Brief assessment of a person's orientation to time and place, recall ability, short-term memory and arithmetic ability. It may be used as a screening test for cognitive loss or as a brief (bedside) cognitive assessment.
Usage	Community dwelling elderly, but also in outpatient and institutionalised populations. Reportedly used extensively, eg. in the USA, and Finland.	Widely used worldwide in the assessment of elderly clients. Settings where used include: hospital inpatient, geriatric outpatients, general practice, community residents, community care.
Application	Subject interviewed by a clinician. Takes approximately 2 minutes to complete	Administered via an interview with the subject. Time to complete, approx 5-10 mins. Can be used by clinical or lay personnel with some training.
Items	10 items covering short- and long-term memory, orientation, knowledge of current events and mathematical tasks.	11 items in two sections: the first verbal responses to orientation, memory and attention questions. The second requires reading and writing, covers the ability to name, follow written and verbal commands, write a sentence and copy a polygon.
Scoring / Interpretation	The number of errors are counted and summed, ranging from 0 to 10. Interpretation needed to take into account race and education: reference standards exist for USA. Baseline ratings: 0-2 intact function, 3-4 mild impairment, 5-6 moderate impairment, 7-10 severe impairment.	Weights assigned to each correctly answered questions are summed. Total ranges from 0 to 30. Cut-off point indicating further assessment usually 23/24 or 24/25. Cut-off point often altered based on educational level. (Uhlmann et al. 1991)
Reliability	Test-retest reliabilities reported as around 0.81-0.85 in different studies. (McDowell et al. 1996) Internal consistency was reported as 0.83 (Leshner et al. 1986)	Test-retest and inter-rater reliability reviewed in many studies (McDowell et al. 1996). Test-retest reliability coefficient mostly high ( $r > 0.80$ ) but falls as time lapse increases. Inter-rater reliability typically also good.
Validity	In community studies, reported sensitivity and specificity have been mixed, with some reporting low sensitivity (34%, 55%) (Fillenbaum et al. 1980; Albert et al 1991) Correlation with other scales have been reported as: 0.79 with Clinical Dementia rating, 0.81 for the Blessed IMC test (Davis et al. 1990) and 0.69 with the Mini-Mental State Exam (Fillenbaum et al. 1990)	Numerous validation studies (McDowell et al. 1996). MMSE scores compared against clinical diagnoses. With usual cut-off points, sensitivity ranged from 0.76-1.0 and specificity ranged from 1.00-0.78. However, sensitivity affected by educational level (Uhlmann et al. 1991). Construct: covers 8 of 11 main aspects of cognitive status (Foreman 1987). Correlates higher to other scales including: Blessed IMC test (-0.88), Dementia Rating Scale (0.82) (Salmon et al. 1990) Scores suggested as indicative of different client groups: mean score of 9.7 for clients with Dementia, mean of 19 for clients with depression or cognitive impairment, 25.1 for clients with uncomplicated affective disorder or depression, 27.6 for normal clients (Folstein et al. 1975)
Comments	Outside the USA, scores may or may not be adjusted for educational level. Modified to remove questions that could not easily be verified by Robertson et al. for use in survey – the Short Mental Status Questionnaire (Robertson et al. 1982). Reliability reported as high.	Reported that MMSE may miss mild cases of dementia. Also misses mild and moderate impairments as they are by most other cognitive screening instruments. Many modifications to the MMSE, including: (1) standardised MMSE which increased reliability (Molley et al 1991); (2) modified MMSE which was expanded by four items for better discrimination among severe levels of dementia (Teng et al. 1987); and (3) an abbreviated MMSE based on 5 items, plus age, which retained high sensitivity and specificity (Klein et al. 1985)

### ***Review of cognitive impairment instruments (cont)***

Scale	The Abbreviated Mental Test (Hodkinson 1972)
Purpose	Developed to measure cognitive decline that is indicative of Dementia.
Usage	Used with elderly; with residents of homes for the elderly, and with mentally ill psycho-geriatrics receiving day care
Application	Interview with subject by clinician. Estimated time to completion, about 5 minutes
Items	10 items covering orientation, short- memory recall, and ability to count.
Scoring / Interpretation	Each correct response gives 1 point and these are summed to produce a rating. Unclear what different ratings mean or what cut-off point is for indicating cognitive impairment.
Reliability	Little published evidence of reliability
Validity	Limited published evidence of criterion validity. Compared against the 37 item Roth-Hopkins test and unspecified longer mental status scales. Correlations with other mental status scales reported as being high; ranging from 0.87 to 0.96 (Bowling 1991)
Comments	Developed from the Modified Roth Hopkins Test (Blessed et al, 1968)

**Table 9** Content of Cognitive instruments\*\*

Dimension	Scale								
	CCSE	Clock	Dem Sx	SP-MSQ	MMSE	3MSE	K-MMSE	IMC	OMC
Consciousness	+	+	+	+	+	+	+	+	+
Orientation	+			+	+	+	+	+	+
Concentration	+			+	+	+	+	+	+
Thought control	+			+	+	+			
Short-term memory	+		+	+	+	+	+	+	+
Long-term memory			+	+	+	+			
Language					+	+			
General knowledge				+	+	+			
Abstraction	+	+				+			
Constructional ability		+			+	+			
Judgement/ insight/ learning new things	+								
Repetition						+			
Appearance/ grooming									
Additional			Items on performing IADL tasks and ADL tasks Items on behaviour and interests						

\*\*Presents a summary only. For exact content refer to scale.

CCSE – Cognitive capacity screening test

Clock – Clock drawing test

DS – Dementia Scale

SP-MSQ – Short portable mental status questionnaire (also Short MSQ)

MMSE – Mini Mental State Examination (and Standardised version)

3MSE – Modified Mini Mental State Examination

K-MMSE – Klien version of MMSE

IMC – Blessed Information-memory-concentration test

OMC – Short Orientation-memory-concentration test (version of IMC test)

## **Behaviour Scales**

There are two major groups of instruments that measure aspects of mental status that are not linked to cognitive function. The first are instruments that aim to screen for depression. The second are instruments that aim to behaviour disturbances.

There are a variety of reliable and validated depression scales in use, the area having been actively researched for many years. These range from purpose-built depression scales to briefer sub-scales or items in more general assessment instruments, such as measures of health-related quality of life. Of the purpose-built scales, most have been used as a screening instrument for depression within particular populations and/or to monitor the affect of clinical treatment. The scales are insufficient for a diagnosis of depression and most should be followed by a clinical interview.

It is unclear to what extent such scales could or should be used within HACC services. Their use could be important as depression is a condition that can be successfully treated. It might also be associated with behaviour disturbances and/or a general increase in dependency and need for assistance. But clearly, an important issue is to avoid using a scale that does not have a sufficiently high specificity (ie. does not lead to many false-positive results).

Given the extent of the depression scales, the review has relied on the sources of systematic reviews rather than the primary articles themselves. From these reviews, two scales of proven validity and reliability in the community sector are the Beck Depression Inventory and the Geriatric Depression Scale. The use and properties of these scales are summarised in Table 10.

In contrast to the Depression scales, instruments to measure behavioural disturbances have only recently been developed. A common feature of the instruments is that the measurement of signs and symptoms of disruptive behaviour like agitation, aggression, or socially inappropriate actions.

In the disability sector as well as in aged care and respite care, the focus on behaviour and especially challenging behaviour, is important in determining levels of service provision and has implications for occupational health and safety issues. However, there are few accepted scales that have been subjected to tests of validity and reliability. The current practice is to check whether a problem exists by the initial problem screen, then seek referral for assessment of an identified problem from specialised agencies, which all have their own preferred tools. For example, a recent (1999) challenging behaviours funding round for the National Respite for Carers Program invited funding for carers of people with dementia, cognitive or behavioural difficulties. Agencies were required to "rely on other appropriately skilled agencies for the assessment of care recipients' needs" (DHAC, Aged and Community Care, 1999).

Of the scales developed, many are designed for use in inpatient or nursing home populations. Such scales include the Overt Aggression Scale (Yudofsky et al. 1986) and the Pittsburgh Agitation Scale (Rosen et al. 1994). It would seem that these could not be easily transferred to use in the community due to their adopted rating scheme, namely: observation of subject over a retrospective period, although the Overt Aggression Scale is based on reporting incidents as they occur. Only a few validated scales were identified for use in the community sector, namely: the Ryden Aggression Scale (Ryden 1988) and the Dysfunctional Behaviour Rating Instrument (Molloy et al. 1991). The use and properties of these scales are summarised in Table 11.



**Table 10**      **Depression Rating Scales**

Scale	<b>Beck Depression Inventory</b> (Beck et al. 1961; Beck et al. 1988)	<b>Geriatric Depression Scale</b> (Brink and Yesavage 1982)
Purpose	Originally designed to measure the depth of depression in psychiatric patients. Since been used as a community screening tool	Designed as a screening tool for depression in elderly people. Focussed on elderly as symptoms indicative of depression in the young are less appropriate for the elderly
Usage	Used worldwide and in a variety of settings, including community care.	Widely used in various settings.
Application	Administered either in interview or by self-completion. Time to complete, approximately 5-10 minutes. Interviewer needs some training.	Normally self-administered, but it can also be read as an interview. If self administered, time to complete is approximately 8-10 minutes.
Items	21 items covering emotions, behavioural change and somatic symptoms.	30 items, which are scored as yes/no. Scale does not rely on detecting somatic symptoms and items designed to avoid defensive responses
Scoring / Interpretation	Each item is rated on a four point intensity scale, and then summed to give an overall score than ranges from 0 to 63. Cut-off point in one community study was 9/10. (Oliver et al., 1984) Guidelines also for relating scores to degree of depression. (Beck et al. 1988) Revised in 1978 so that items refer to "the past week" rather than "today".	Items refer to feelings over the last week. Each depressive answer is scored as 1 point, with the total overall ranging from 0 to 30. The cut-off point is typically 10/11, but others have used 14/15 (Brink 1989). Guidelines on relating scores to degree of depression are: 0-10 normal, 11-20 mild, 21-30 moderate to severe.
Reliability	Various evaluations reviewed (Beck et al. 1988). Alpha coefficients of internal consistency ranged from 0.76 to 0.95. Test-retest reliability ranged from 0.48 to 0.86 varying with time interval and patient population. Among elderly depressed and normal patients, reliability was 0.79 and 0.86 respectively (Gallagher et al.1982)	Various studies show high internal consistency (McDowell et al. 1996), including Rule et al. (1989) who reported Conbach's alpha ranged from 0.80 to 0.85 across 5 age groups from 29-99 years. Test-retest reliability shown to high: at one week, correlation = 0.85 (Yesavage et al. 1983). Inter-rater reliability in a sample of nursing home residents was 0.85 (Brink et al. 1983)
Validity	Extensive validation evidence. Covers 8 of 9 DSM-III criteria, omitting agitation. (McDowell et al. 1996) In review by Beck, 3 concurrent validation studies reported coefficients for non-psychiatric patients ranged from 0.55 to 0.73. Correlations with Hamilton Rating Scale for Depression in 2 studies were 0.73 and 0.80. (Beck et al. 1988) Correlates well with other validated scales. Sensitivity and specificity were reported as 85% and 86% in one study of community residents (Oliver et al, 1984)	Comparable performance to the Hamilton Rating Scale for Depression in discriminating between patients with different levels of depression (Yesavage et al. 1983). Correlated highly (0.85) with Beck Depression Inventory for sample of US veterans (Norris et al. 1987). At cut-off point of 10/11, sensitivity and specificity reported as 84% and 95% respectively (Brink et al. 1982). Lower values of 82% and 67% were reported elsewhere but among hospital patients (Koenig et al. 1992). Performance falls among people with dementia, the threshold in one study being put at a score of 14/15 on the MMSE (McGivney et al. 1994)
Comments	Most validation and reliability studies were performed on the original version. The revised version was intended to measure more stable characteristics. Its degree of success is unclear. Still regarded as one of the best screening tools available for depression, but concerns have been raised about its specificity (McDowell et al. 1996).	Short form of GDS, 15 items, proposed for use in people with dementia or who are physically ill (Sheikh et al. 1986). Evidence from Isreal that some questions might not have equivalent meanings in different ethnic groups (Cwikel et al. 1988)

**Table 11 Instruments to measure challenging behaviour**

Scale	<b>Ryden Aggression Scale</b> (Ryden 1988)	<b>Dysfunctional Behaviour Rating Instrument (DBRI)</b> (Molloy et al. 1991)
Purpose	To measure aggressive behaviour in community based people with dementia	Rating of behaviour in community-living elderly people and the effect of behavioural disturbances on carers
Usage	Unclear how widely used	Unclear how widely used.
Application	Questionnaire completed by informant. . Time to complete, approximately 20 minutes.	In interview, questionnaire to be completed by care giver. Time to complete, approximately between 10-15 minutes.
Items	25 items, each of which is a specific aggressive behaviour. Can be summarised as physical aggression against others or objects (not self), verbal aggression and sexually aggressive behaviour	25 questions. Items cover agitation, aggression, sleep disturbance, wandering, delusions, depressed mood, repetitive behaviour and anti-social behaviour in public
Scoring / Interpretation	Each item rated on a 6-point scale for frequency of problem. Unclear how often the instrument would be used, possibly on a monthly basis.	Each item rated on a 6-point scales for frequency and extent of problem. Would appear instrument is used on a monthly basis.
Reliability	Limited. In a pilot study of 183 people, inter-rater reliability was 0.88 and test-retest reliability was 0.86	Limited. Intra-class correlation coefficient for inter-rater reliability was 0.75
Validity	Face validity only	Construct validity assessed in comparison to the Standardised Mini-Mental Scale. Significant negative correlations reported between DBRI and Standardised MMSE.
Comments	Other aggression scales include questions on aggression towards self. Others also use alternative ratings: frequency, extent of problem and nature of intervention required.	

## A2.5 Glossary of statistical terms

Correlation is a measure of association that indicates the degree to which two or more sets of observations fit a linear relationship. The strength of correlation is indicated by a coefficient that lies between  $-1$  and  $1$ .

Cronbach's Alpha is a generalised formula used to express the internal consistency (a measure of reliability) of an instrument.

Kappa a coefficient that expresses the level of agreement between two raters above the level that would be expected by chance alone.

Kendall's tau represents a measure of association (correlation) between variables measured at the ordinal level.

Spearman's rho represents a measure of association (correlation) between variables measured at the ordinal level.

## Attachment 3 Review of Current Practice

### Overview

This part of the review does not summarise the international literature on assessments of functional dependency – this was covered in the Stage 1 Report. The tables that follow cover international guidelines, national systems and projects, national HACC Program developments, State and Territory projects and systems, and client classification-style projects that make use of dependency data items.

From the international level, current practice is shaped by international agreements, particularly between those of member states of the WHO, as well as by reports in the international literature. The WHO's International Classification of Impairments, Disabilities and Handicaps and its further refinements, is intended to guide national approaches to data items and give comparable definitions and universal scales for inclusion in national data sets.

There are a number of national program-based systems of data collection for primary medical care involving assessment and these overlap the different requirements for residential aged care, for disability programs and for veterans. At the national level there are also relevant small studies and reviews, program and setting specific instruments as well as large-scale trials making use of functional assessment data. In some cases, most notably the Commonwealth's coordinated care trials, these demonstrate how items measuring client dependency can provide a link between assessed client need, care planning, service plans, funding and resource allocation. The framework around these trials has been shaped to a large extent by the national agenda of assessment and information sharing promoted under the HACC Efficiency and Effectiveness reforms.

Section 4 of the review covers current activities in the States and Territories and the round up includes a number of State-level HACC specific and related projects, as well as those using tools that cross professional and program boundaries. The main inconsistencies found in State level activity in NSW relate to disability-specific services where the concepts of client classification are less well understood. In Victoria there is notable work being done on screening for initial needs assessment and in tools for use in post acute care.

At local level within some regions and in some smaller scale studies of State-wide relevance, there are examples of sophisticated systems and useful tools that demonstrate the potential of simple, but consistently used functional dependency data items within a larger system of classification for the purposes of resource allocation. In Queensland there has been attention paid to the plethora of similar, but not easily comparable forms within the ACAT network, and a hospital-based HACC trial of a generic form and risk assessment tool.

Section 5 shows relevant client classification-style studies that have used dependency data items as "splitting variables" when constructing a class assignment algorithm. This work is important because it brings together the technical and statistical performance of the particular scales and data collection tools that are used, and relevant clinical and service practice. For client groups to have meaning they have to be both homogeneous with respect to resource use, and also clinically sensible.

The review of current practice shows the overlap and variations on a consistent theme when service providers and assessors get together and create new forms that include data items to capture functional dependency. Most use the widely known ADL and IADL scales – most commonly modifications of the Barthel and Lawtons scales and selected item from the OARS forms. The MMSE is the mostly used cognitive assessment tool, especially for degenerative

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conditions and dementia, but many other mental/emotional/interaction/motivation/behaviour scales and checklist forms are in current use.

Based on the review material and information sent at the request of the project by State and Territory representatives, by managers of programs and by problem and setting specific projects, a clear position has emerged. A recognised set of instruments, familiar to current practice, incorporating both screening and assessment functions, is clearly an acceptable development to the majority of practitioners.

Indeed, many care coordinators and service planners have realised that they can't afford to wait for common or national approaches to be agreed at higher levels because they have immediate issues to resolve and they need better data than what they are being asked to report for the various programs. So they have designed their own forms.

In many cases the resulting scales and forms make clinical and even managerial sense, but don't necessarily add up reliably in the ways intended. The technical review at Attachment 2 illustrates this point in some detail. The different modifications and adaptation are not really useful as part of an MDS because they contain too much variation. Related to this is the issue for client risk assessment, that in most cases there is not much point in using a total scaled score that sums up everything. There will always be problems in combining scores over several domains.

Much of the effort in designing essentially the same forms is not wasted because it greatly assists the development of local information sharing and data collection activities. But seen from further up the administrative chain it is a duplication of effort with no resulting comparable set of items that would be worth collecting because they would be too difficult to analyse. This is perhaps the most convincing argument for a more planned and developmental national approach.

The steps that have already been taken towards such a national approach are described in section 6 of the following summary tables, which covers the more specific aspects of the HACC administrative reform agenda that lead up to the recommendations from the current project.

**Table 12** Current Practice: Summary Table of Programs and Activities Reporting Dependency Data Items

\* Denotes where a system, project or detailed study contains data items potentially in scope for mapping to the recommended HACC MDS items.

Recent and Current Practice -	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>1. International</b>				
1.1 International Classification of Impairments, Disabilities and Handicaps ICIDH-2 beta -2 draft 1999. <sup>2</sup>	WHO classification framework may be built into Disability Data Elements in NCSDD model	Activity, not disability and participation not handicap, plus environmental factors	Tools use neutral language can mostly be mapped to existing scales.	Social model (body, individual, social) gives functioning at body, person and social levels> This a different conceptual base to current ABS survey categories. Universal scale = no problem, mild, moderate, severe, complete, not spec, not applicable. Model expected to be built into data dictionaries. *
1.2 International Classification of Primary Care <sup>3</sup>	This is a system for GPs that relies on key word access to a pick list of connected terms.	There are 2 products - ICPC (international version) and ICPC+ Australian version).	Selection of the preferred term by the practitioner completes the coding process.	ICPC has been utilised extensively in Australia, especially by the Family Medicine Research Unit (FMRU) at Sydney Uni and looks likely to become the international standard for primary care data. The website for ICPC is: <a href="http://www.ulb.ac.be/esp/wicc/icpc2.html">http://www.ulb.ac.be/esp/wicc/icpc2.html</a> *
1.3 Elderly at risk rating scale (EARRS) <sup>4</sup>	Legislative requirements for UK GPs' health assessments for older people (75+)	EARRS tool tested for reliability and validity	12 items on physical risk - falls, ADL, drugs, vision and hearing. 4 items each on mental and social risks. Barthel covers 10 items in EARRS.	Sensory function, mobility, mental condition, physical condition, continence, social environment, use of medicines. EARRS has validity and reliability in day hospital and community settings. Better than Barthel as it avoids ceiling effects. *
1.4 European Union Consensus Conference: WHO group of experts in health and social care <sup>5</sup> .	Agreement on a standardised medical and social assessment	EPIC Assessment system (EASY) has 6 domains determined by a consensus based approach.	SF36, OARS IADL, Barthel, WHO 10 item Well-being scale	Domains: 1. perceived health and well-being; 2. individual needs, goals and satisfaction with care; 3. confusion, behaviour and depression; 4. vision, reading, hearing and chewing; 5. instrumental and personal activities of daily living; 6. housing, finance and carer. *

<sup>2</sup> ICIDH-2 International Classification of Functioning and Disability. Beta 2 draft, July 1999. WHO Assessment, Classification and Epidemiology Group, Geneva.

<sup>3</sup> For detail see the Family Medicine Research Unit (FMRU) at Sydney University [www.fmr.org.au/classifi.htm](http://www.fmr.org.au/classifi.htm)

<sup>4</sup> Donald I development of a modified Winchester disability scale - the elderly at risk rating scale. *Journal of Epidemiology and Community Health*. 51(5):558-63, 1997 Oct.

<sup>5</sup> Philp I. (1997). Can a medical and social assessment be combined? *Journal of the Royal Society of Medicine*, Supplement No. 32, vol. 90: 11-13

### Current Practice Summary Table continued...

Recent and Current Practice	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>2. National</b>				
2.1 Enhanced Primary Care Initiative, 2000 <sup>6</sup> .	Guide current practice in annual GP health assessments for older people.	All older people 75+ or with complex care needs. GP-based tools are partly determined by specs attached to particular EPC item numbers	checklist responses to mental status, mood, independence/social support, continence, safety, mobility, medication	RACGP tools include various non-standard measures of function Y/N item checklist responses to 27 questions across a series of domains – (full list =services, smoking/alcohol, physical activity, physical exam, nutrition, mental status, mood, independence/social support, continence, safety, mobility, medication, prevention). Mapping of these items to agreed functional measures would be possible. *
2.2 ASGM Position Statement on Geriatric Assessment and Community Practice <sup>7</sup>	Describes background, principles and methods	Describes current assessment approaches and tools	Recommends measures of cognition and functional status to cover ADL and IADL domains.	FIM and Barthel are OK in rehab settings but less useful in ACAS assessment - "no specific valid instrument exists for the purposes of this form of assessment" p.169.
2.3 Residential Aged Care Systems <sup>8</sup> and CACP AIHW review <sup>9</sup> , 1999.	AIHW reviewed & compared data items across various MDSs in aged care and disability	Report of Community Care Data Develop. Project - part of National Information Develop. workplan.	Comparison of standard collection tools and assessment instruments (Barthel, RDNS, Katz, RUG, OARS, Lawton, FIM).	See AIHW appendix B: Comparisons and mapping of instruments was undertaken for ACAT, RCS approvals, DNCB, CSDA, CIARR, COPS, HACC Users, Community Nursing, ABS, ICIDH. (Section 5 of the report covers mapping to the HACC MDS) *
2.4 ABS Survey of Disability, Ageing and Carers 1998 <sup>10</sup>	National survey gives estimates of rates of different levels of disability	Population sample	ABS disability categories for core activity restriction self care, mobility, communication. Scale = profound, severe, moderate, mild.	ABS expects to move its categories into line with the WHO model and its more neutral language. *

<sup>6</sup> RACGP. Standards and guidelines for the Enhanced Primary Care Medical Benefits Schedule items.

<sup>7</sup> Australian Society for Geriatric Medicine. Position Statement No.8 Geriatric Assessment and Community Practice. *Aust. J. on Ageing*. Vol. 19, No.4, November 2000, pp 165-171.

<sup>8</sup> Residential Care Manual, Aged and Community Care Division, Commonwealth DHAC. Chapter 5, March 1999.

<sup>9</sup> Review of the Resident Classification Scale. Aged and Community Care Service Development and Evaluation Reports, 1999, No.36.  
Ryan, T. Holmes, B. & Gibson, D 1999. A national minimum data set for Home and Community Care. AIHW cat. no. AGE 13 (Aged Care Series), Canberra AIHW.

<sup>10</sup> ABS (1998), cat. no. 4430.0.

### Current Practice Summary Table continued...

Recent and Current Practice	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>2. National</b>				
2.5 DVA - Veterans Home Care Standard Assessment <sup>11</sup>	Current trial of draft instrument for all DVA clients. DVA has RFT on further work.	Phone assessment at front end(16Qs), plus ADL scores with detailed assessment f/up for care plan	Uses a set of non-standard questions covering service needs - dependency score/15 on front end for phone assessment	DVA put new forms in Jan 2001. Current draft uses self care 6-item scale with score/15, and IADL 5 item scale gives dependency score/15. Needs further work. Mapping of these items to agreed functional measures possible. *
2.6 National Dementia Behaviour Advisory Service - Problem Behaviour Scale	Telephone advisory service on behaviours and cognition issues. NDBAS also developing a checklist tool for respite care staff	Identify behaviours of concern: frequency, disruptiveness, (to whom) and changes after strategies are implemented.	Uses a 5 point scale to measure behaviours of concern ( Adapted from Behaviour Problem Scale developed by Applied Age Care Solutions Pty Ltd)	The Behaviour Problem Scale used by NDBAS is being considered as part of the checklist and screening tools that can be circulated to community respite care providers that reliably describe behaviours of concern and cognitive problems. NDBAS is focussed on sharing information that will lead to consistency across Australia in assessment tools. *
2.7 Commonwealth Impairment and Work Ability Tables	Determine eligibility for income support	Tools to test eligibility of people with disabilities	8 dimensions related to work ability	Uses 2 tier assessment framework *
2.8 Coordinated Care Trials eg Illawarra CHSD, 2000 <sup>12</sup>	Local evaluation study in Illawarra for care planning and funds pooling pilot 1997-1999.	Complete episodes over 23 months for 1800 community care clients.	Used a set of eight scales, using standard measures of function: GP assessment, self -report, FIM, SOMCT, Lawtons IADL, HoNOS (2 items), carer availability.	Assessment tools were tested for reliability within the trial. Papers showing more detail on tools are available <sup>13</sup> . Analysis showed the problems of floor and ceiling effects of these measures in community care settings. *

<sup>11</sup> Manual for DVA Draft Assessment Instrument. See Appendix 4 to section 2.

<sup>12</sup> Eagar K, Owen A, Perkins D, Adamson L, Quinsey K, Harvey R and Green J (2000) *The Care Net Intervention. Report 2 of the Final Evaluation of the Care Net Illawarra Coordinated Care Trial*. Centre for Health Service Development, University of Wollongong. ISBN Number 0 86418 622 3

<sup>13</sup> Eagar K and Woods K, 1999, Client assessment the starting point for coordinating care. Chapter 3 in Department of Health and Aged Care *The Australian Coordinated Care Trials: Methodological issues in trial design and evaluation*. ISBN 0642393834 <http://www.health.gov.au/hsdd/cocare/pdf/cctbook2.pdf>

Cromwell, D. 2001. Analysis of Care Net assessment data to inform the design of screening and assessment tools. CHSD, Uni of Wollongong.

### Current Practice Summary Table continued...

Recent and Current Practice	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>3. National HACC Program Projects and Activities</b> See also section 6 below for additional studies and reports relevant as background to this current project				
3.1 National HACC classification workshops and papers 1995-1999 The logic of outcomes measurement dictates a clearer focus on populations	Develop strategy on how to move the general focus from services planning onto the users and non-users of HACC services. Community care classification - what does it offer? March 1996 <sup>14</sup> .		Discussion Paper, with development options and timetables. Included issues of dependency items and how they might be used	Introduced the concepts of classification of clients into the community care and support services. Emphasised benefits of standardising descriptors of client needs. No tools were recommended, but the report had options for developing a classification system for community care.
	Classifying the care needs and services received by HACC clients. A Review of the options. April 1999 <sup>15</sup> .		Discussion Paper, review of studies and tools, options and implementation timetables	The report recommends a development pathway, based on measures of need for care rather than services provided, and capable of being built into routine assessment. Included examples of different scales used in practice and specialised studies. Discussion includes improvement of dependency items.
3.2 National Framework for Comprehensive Assessment - 1998 <sup>16</sup>	Review for the Assessment Working Party	National framework covering objectives, scope, role, competencies and client indicators	Indicators include self-care and vulnerability - no specific scales were recommended in report.	Competencies include understanding measures of physical, mental and social functioning (p.21-2). Framework does not consider the screening role as separate because focus is comprehensive.
3.3 National Review of CIARR <sup>17</sup> , 1996-9.	Scoping study and plan for a national approach to information sharing.	Includes review of electronic info sharing protocols	Items include 8 tasks of daily living (I/WA/D/NA), 8 tasks of self-care (Y/N) and transport (4 options)	This includes description of current electronic data transfer options. Framework for how dependency data items could be used. *
3.4 HACC Targeting Study 1999. <sup>18</sup>	Review of policy and national assessment and priority setting practices	All HACC clients, plus specific studies in Victoria.	Policy and data analysis and a set of recommendations.	The review included recommended new ATSI and NESB items. Unlikely to be long term technical problems in including this work as part of any new dependency items. Suggests no single national is approach likely.

<sup>14</sup> Gill Lewin and Kathy Eagar. Community Care Classification - What Does It Offer? CHSD Uni of Wollongong, March 1996.

<sup>15</sup> Don Hindle Dremsel Pty Ltd. Classifying the care needs and services received by HACC clients. A Review of the Options. Aged and Community Care Service Development and Evaluation Reports, April 1998, No.33.

<sup>16</sup> Lincoln Gerontology Centre. National Framework for Comprehensive Assessment - Aged and Community Care Service Development and Evaluation Report No. 34, March, 1998.

<sup>17</sup> Brian Elton and Associates 1996. National Review of HACC Data Requirements. Final report: Future Directions. Canberra, Commonwealth Dept of Health and Family Services.

<sup>18</sup> NIAR/Bundoora Extended Care. Targeting in the HACC Program - Aged and Community Care Service Development and Evaluation Report No. 37, July, 1999.



### Current Practice Summary Table continued...

Recent and Current Practice- States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.1 NSW</b>				
Note that NSW ADD - Ageing and Disability Department now known as the Department of Ageing, Disability and Home Care				
4.1.1 Community Options (NSW) add-on to CIARR form - ADD	Form to give COPS data on client needs and service and equipment options	Case management oriented data collection tool	Part B includes 14 domains relevant to functional dependency.	Scales are descriptive of service needs and items covering functional domains do not use standard tools or scoring. *
4.1.2 HACC MDS & CIARR Projects for NSW Health and ADD based on SNAP. CHSD 1999, 2000.	Test feasibility of linking HACC data into the development work on SNAP through NSW Health	SNAPshot is a front end screening and info sharing tool - implementation 1999-2002.	SNAP classification tools plus RCS, ACAT, HACC MDS and CIARR. Covers a range of data items across different data sets.	Examples of mapping of items using SNAP-based software were included in an attachment to the Stage 1 Report - software compatible with HACC, mental health and aged care information system tools. *
4.1.3 NSW ADD* Community Living Development Unit, Disability Services Program	Support Needs Assessment Profile used to assess for supported accomm. & accomm. support	Physical and social support needs of people with disabilities/MH/ aged	Range of non-standard items in scales covering self care and domestic functioning, behaviour and social supports.	Non-standard format overall but includes items from RUG ADL, HoNOS, Behaviour Scale). Compounds client and service characteristics in scales - uses rating scale for level of assistance needed (1-6). Platform includes Support Needs Assessment Profile (SNAP) software that covers rostering/award levels, inputs and outputs (hours).*
4.1.4 NSW ADD Private Boarding Houses Placement Program <sup>19</sup>	Joint Program ADD Health as part of Boarding House Reform Strategy	Project on tools to assess people with disabilities/MH/aged.	SNAT= LBH entry screening tool used to allocate clients to a category assessed as hi-needs.	Assessment framework has screening tool (non-standard format but includes RUG ADL, HoNOS, Behaviour Scale). Rating scale for level of assistance needed (1-6). Support Needs Assessment Profile (ADD-SNAP) software includes rostering/award levels, inputs and outputs (hours). *
4.1.5 Support Needs Assessment - Vermont Tool <sup>20</sup> .	Disability-specific tool used under contract with copyright owners	Physical and social support needs	Non-standard items in scales for self care and domestic functioning, behaviour and social supports.	Used by NSW Dept of Community Services and NSW ADD Community Living Development Unit, and by services in Victoria (see 4.2.5 below) *.

<sup>19</sup> NSW Ageing and Disability Department, NSW Health Department, NSW Department of Community Services. Licensed Boarding House Entry Screening Tool. July 1999, draft. Manual contains individual assessment and service plan and SNAT.

<sup>20</sup> Vermont Consulting (G.Vermont for the State of Victoria), 1998. Support Needs Assessment v3.1 Handbook. (Copyright 1992-7).

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.1 NSW</b>				
4.1.6 Post School Options NSW ADD*	Form for eligibility for individualised allocation to training places	Younger people with disabilities after school years completed.	Support needs cover personal care, mobility, communication/cognition, social skills, behaviour, transport	Non-standard assessment tools used as a checklist with options for NA, nil, occasional, frequent, continuous. Links to education sector work by consultants at Newcastle Uni and to workability tests.
4.1.7 Attendant Care Application Form and assessment tool NSW ADD/AQA	Eligibility assessment tool for program management	Personal Care Support Needs section uses total weekly time.	Uses dependency score (time) – as part of individualised program allocation tool	Tool used to help assess eligibility and prioritise the allocation of hours available in the program. Covers use of assistance devices, ADLs, use time scale. Mainly Y/N answers and text fields.
4.1.8 Community Care Assessment in NSW <sup>21</sup> , November 1998.	A Framework for the Future - Discussion Paper	Policy framework for objectives of multiple projects	Not prescriptive on tools to be used.	NSW Ageing and Disability Department, NSW Health Department, NSW Department of Transport, and Commonwealth Department of Health and Aged Care.
4.1.9 ATLAS - Adult Training, Learning and Support	School leaver assessment form.	Eligibility for day programs, supported employment	Social skills, mobility, personal care, communication, cognition, behaviour, transport	Non standard measures used as a checklist with options for occasional, frequent, continuous.
4.1.10 Service Access System <sup>22</sup> .	Information to help prioritise requests and allocate resources.	People with disabilities to determine eligibility and refer for support planning	Uses a service provision focus and does not use data related to functional dependency.	Checklist questionnaire focused on general client characteristics, current service profile and additional service requests. This form does not contain any items that can be used to determine levels of functional dependency to allocate places on the basis of demonstrable need
4.1.11 Ascertainment Instrument NSW Department of Education and Training <sup>23</sup>	Resource allocation tool for State Integration Program Younger people with disabilities in mainstream schools	Tools allocate teacher and teacher aide resources (hours)	New and non-standard tools being finalised in conjunction with Newcastle University project	Items may be mappable to recommended tools. This program fits with other vocational and education sector work.

<sup>21</sup> Community Care Assessment in NSW: A Framework for the Future - A Discussion Paper, November 1998.

<sup>22</sup> Service Access System Request for Support Form, NSW Ageing and Disability Department, September 2000

<sup>23</sup> NSW Department of Education and Training State Integration Program 1999 Guidelines. University of Newcastle-based project. Draft framework expressed as continuum of support needs.

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.1 NSW</b>				
4.1.12 NSW NESB Dementia tool	Develop a Cross Cultural Cognitive Screening Tool	NESB and other people with cognitive impairment	Pilot study over 3 years starting with 40 items in a tool being tested.	Should link ideally with SNAP and MH-CASC psychogeriatric and other classes, but likely to be using different instruments. NSW Health and Liverpool Hospital study with results expected across 150 people. *
4.1.13 Multi-Purpose Services NSW (CHSD 2000) <sup>24</sup> .	Rationalise data collection system for NSW MPS sites	Data items for ISC, RCS, HACC MDS being analysed for redundancy and consistency	All NSW MPS sites use multiple tools. The potential for simplifying the system is to be assessed by this project	200 items reviewed, 100 items possible, costing study will assist in selection of final set of items that can be used for benchmarking purposes. *
4.1.14 Population Group Planning <sup>25</sup>	Joint planning and resource allocation tools for NSW	Service hours used for resource levels in most service types.	Needs Index uses whatever reliable client data are available .	Planning and resource allocation framework that recommends dependency data items being collected to improve the quality of the data used in the model. *
4.1.15 Northern Rivers AHS - CHSD <sup>26</sup>	Local survey using State of Origin Clinical Codes. All CH clients	18,000 occasions of service. Minutes per OOS. Can use some cost weights	Survey used a set of tools as per SNAP and other available codesets.	Survey of community health clients used 159 classes in 16 superclasses for community health clinical codes. Classes include cost weights that incorporate dependency levels. *
4.1.16 Integrated Community Transport Coordination Planning Project <sup>27</sup>	Develop a transport related classification and a set of resource allocation tools	Health Related Assisted Transport Services in the Illawarra	Describes a set of classification variables that are more detailed than other transportation and mobility items: example of a study that would inform further generation work	Scale based on client descriptors: <ul style="list-style-type: none"> <li>• alert and orientated to self, time, place and purpose</li> <li>• ambulant with/without walking stick</li> <li>• able to secure/ gain access to home</li> <li>• able to walk from home to car unaided</li> <li>• able to climb 2 steps unaided</li> <li>• able to walk 30 metres unaided</li> <li>• able to conduct business at destination. *</li> </ul>

<sup>24</sup> Gordon R et al, 2000. Development of an MDS and benchmark costs framework for the Flexible Rural Health Services Program, NSW Health. Centre for Health Service Development, University of Wollongong.

<sup>25</sup> NSW Ageing and Disability Department, NSW Health and Commonwealth Department of Health and Family Services. *Population Group Planning*: Position Paper, December 1997, Health Services Research Group.

<sup>26</sup> Eagar, K et al 1999. Measuring and Classifying Primary and Extended Care Services in the Northern Rivers. Centre for Health Service Development, University of Wollongong, February.

<sup>27</sup> Integrated Community Transport Coordination Planning Project Discussion Paper 1: Health Related Assisted Transport Classification Framework, April 2001. [solsen@wollongong.nsw.gov.au](mailto:solsen@wollongong.nsw.gov.au)

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.2 Victoria<sup>28</sup></b>				
4.2.1 Department of Human Services Post Acute Care 1997-98	Improve tools for PAC Program to determine risk, eligibility and priority	Trial of Risk Assessment Screening Tool for admitted patients	Final report on PAC program study includes validation study of the tool.	Because no formal data collection is done on the basis of this work, it is not known how the tool is being used and/or modified to inform care planning. Data collected in the field testing expected to provide feedback on client screening and improve data collection. *
4.2.2 Department of Human Services - Client dependency data study 1998	Initial investigation of improved data items on client dependency	Data from a 10% sample of HACC agencies and all Linkages clients	14 items collected over a four week period	General feedback sent at request of consultants is that there is variable application of different tools across the State. Raw data from the dependency study is available for analysis.
4.2.3 Department of Human Services HACC and ACAS	Current HACC and ACAS practice description	HACC and ACAS clients	Barthel, FIM, MMSE and 10 pt depression scale	Feedback from ACAS to the Dept indicates the Barthel is easy and commonly used, and MMSE good for cognition if used with a depression scale
4.2.4 Department of Human Services Rehabilitation	Tools to use as part of CRAFT inpatient payment system	GEM, rehab. and palliative care patients and community clients	GEM and rehab use Barthel, pall care uses RUG-ADL	In the context of CRAFT system, the Barthel and FIM are not considered to be useful in community settings
4.2.5 Department of Human Services DisAbility Services Division <sup>29</sup>	Disability Services Assessment Project	Linking assessed support needs to resource allocation	Based on the Vermont tool for Support Needs Assessment v3.	Aimed to develop and implement a single, standard assessment and procedures to link resource allocation to an individual's assessed support needs.
4.2.6 Department of Human Services. Primary Care Partnerships – Better Access to Services Project 2000-1	Includes a tool template for Initial Needs Identification and for Care Planning in primary care settings	Development of tools for use in primary care partnerships	Project on core consumer information plus consistent framework to determine risk, priority, relative urgency	Initial needs and care planning tool templates to be incorporated into PCP care planning tools and Primary Care MDS. *

<sup>28</sup> Current practice description prepared by DHS Victoria and sent at request of consultants.

<sup>29</sup> For detail on this project and other related projects see DisAbility Services Division website: <http://hnb.dhs.vic.gov.au/ds/disabilitysite.nsf/pages/research>.

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.3 Queensland</b>				
4.3.1 Queensland State ACAT Conference May 1998 <sup>30</sup> .	Understanding the impact of the aged care reforms. ACAT assessment of clients.	Selection of assessment forms currently used by teams.	Barthel, modified Lawtons, SCOMT, MMSE, MSQ, Abbreviated Mental Test, Behaviour Scale, mobility/falls.	Referral forms contain domain checklists and free text. Many versions of partial item lists from recognised forms and other improvised items. Functional profiles have abilities covered: mobility, falls, mental, mood, thought, behaviour, cooperation, comprehension, communication, interpersonal, continence, caregiver support. Environmental and social risk factors are covered. Some also use GHQ28, Brief Behavior Symptom Rating Scale <sup>31</sup> . Note the range of tools used to cover the cognitive domain, with forms mostly allowing for alternative scores and tools.
4.3.2 Brisbane South Combined Nursing Agencies Project 1000 June 1998 <sup>32</sup>	Evaluation of a collaborative service delivery model	HACC clients	OARS physical and instrumental activities of daily living scales	Functional measures used in conjunction with client details, well-being, carer strain, services and quality of life. Tools could successfully identify those with complex care needs.
4.3.3 QE2 Assessment Project, August 1999 <sup>33</sup> .	Identify and evaluate generic assessment tools and a manual for Health HACC.	Tested a generic tool, a suite of standard tools and a risk assessment tool.	Modified Barthel, OARS physical & instrumental ADL & social, Caregiver Strain Index, MSQ, MMSE, Mental State Assessment Form, Geriatric Depression Scale, Falls Efficacy Scale, receptive and expressive communication, environmental, cultural,	Project attempted to develop a risk assessment tool as the sum across a set of 10 domains: carer status, support systems, ADL, IADL, mobility, access, continence, sensory, language, mental and cognitive.

<sup>30</sup> Report on Qld State ACAT Conference, Nambour and Townsville, May 1998. Appendix II contains a collection of forms see also Wide Bay ACAT database version 3.3.

<sup>31</sup> A version of this scale described as the BNRS is described in the National ACAT Dementia Training Program Workbook.

<sup>32</sup> Spice Consulting. Evaluation - Brisbane South Combined Nursing Agencies Project 1000, June 1998.

<sup>33</sup> Report of the QEII Assessment Project, QEII Hospital Health Service District and the HACC Program, August 1999.

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.4 Northern Territory</b> <sup>34</sup>				
4.4.1 Northern Territory Remote ACATs	Functional assessment in remote settings	Guide to local eligibility decisions in remote and aboriginal communities	FIM, modified Barthel Barthel, Adaptive Behaviour Scale, MMSE, GDS, HART, (Handicap Assessment and Resource Tool).	Regular use of FIM, Modified Barthel, MMSE, GDS. Some work has been done on developing a dementia assessment tool for remote communities. *
4.4.2 Darriba Nurri COPS	Assessment sheet to determine eligibility for services.	Top End Aboriginal COPS.	Mobility, self care, home, community life.	Checklists of functional items covering ADL and IADL areas help determine eligibility. *
4.4.3 Yuendumu Old People's Program	Tools for HACC services providing MOW, personal care and laundry	Urban indigenous community Remote indigenous community	Lists of simple criteria for needing the service	Series of non-standard tools – mainly in the form of simple questions about functional abilities. If more assessment is needed, client is referred to ACAT *
4.4.4 Red Cross Home Care Service	Assessment form	Guidelines to determine service eligibility	MSQ, modified Barthel and Lawtons items	Social supports, networks, mental status, mobility and exercise, continence, ADLs, IADLs, communication, physical environment. *
4.4.5 Council on the Ageing NT	Client assessment form	Guidelines to determine service eligibility	Mobility and ADL items are modified OARS, Barthel and Lawtons items	Self care items include a mix of ADL and IADL scores. *

<sup>34</sup> Current practice description prepared by THS and sent at request of consultants

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.5 South Australia<sup>35</sup></b>				
4.5.1 Brain Injury Options Coordination Service	State wide brokerage of service packages for people with brain injury	Improved measurement of functional abilities specific to brain injury	Investigating the usefulness of FIM, Barthel, Lawtons OARS	Note there are data items on function collected by this agency that are specific to the needs of brain injury clients - but tools used do not include the MMSE. *
4.5.2 Southern Domiciliary Care Service	Established multi-disciplinary support service for aged care and disability clients	Improved tools for the measurement of functional capacities in clients	Uses modified Barthel, FIM, Barthel, Lawtons OARS subscales	Aggregate Barthel and IADL scale indicators used for reporting client-level data to SAHC. *
4.5.3 Support Link/Northern Venture	Brokerage and care coordination	Fits with RDNS referral form and assessment summaries	Study to improve design of forms - Modified Barthel, Lawtons OARS items.	As part of developing new tools the agency has analysed relevant local referral and assessment tools. Aim is to move from mostly free text entries to scores on recognised scales. *
4.5.4 Royal District Nursing Service	Items for costing and classification form part of referral process.	Referral form based on RDNS classification of clients	Modified Barthel and OARS IADL subscale.	Includes measurement of key variables driving cost in nursing services. Aggregate Barthel and IADL scale indicators used for reporting client-level data to SAHC *
4.5.5 Behaviour Advisory Service (Aged Care). State Psychogeriatric Care Unit based at Alzheimer's Ass. (SA) Inc	Provides advice and assistance in assessing behaviours of concern and the development of strategies for on going care	Works with staff to assist residents of Commonwealth Funded Aged Care Facilities and programs	Range of assessment tools – 7 point Behavioural Problem Scale <sup>36</sup> ; 24 hr Behr Chart; Residtn Distress Scale, Cornell Dep in Dementia Scale; Goal Attainment Scale	Note evaluation of Behaviour Assessment Guide. The Guide is for staff of residential facilities to use a problem solving approach to managing behaviours of concern. Focuses on identifying contributing factors to cause the behaviours of concern: resident's physical & emotional health, cognitive decline, personality and past experiences as well as the attitudes and skills of staff & the impact of the environment.

<sup>35</sup> Current practice description prepared by agencies and sent to consultants at request of state contact

<sup>36</sup> Applied Aged Care Solutions Pty Ltd

### Current Practice Summary Table continued...

Recent and Current Practice - States	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>4.6 Western Australia</b>				
4.6.1 Current Statewide data collection	State based data collection builds on Silver Chain work	Includes a test of data collection forms	Scales based on Lawtons OARS and Barthel	Vision, hearing speech, and use of modified IADLs, physical functioning ADL on 3 and 4 point scales, personal care MH. Section B carer role, client behaviour.
<b>4.7 Tasmania<sup>37</sup></b>				
4.7.1 Current Statewide data collection	State based data collection	Regular collection of HACC MDS items on clients	Based on HACC MDS, national assessment framework and NSWCIARR	No specific scales recommended but common practice is use of recognised ADL and IADL scales.
<b>4.8 ACT</b>				
4.8.1 Consumer Support Needs Assessment <sup>38</sup>	Discussion paper based on support needs assessment	Reports on consultation on service access model	Based on national assessment framework and NSW CIARR	No specific scales recommended

<sup>37</sup> Current practice description by direct communication with consultants

<sup>38</sup> Consumer Support Needs Assessment for Home and Community Care (HACC) and Related Services in the ACT. Discussion Paper Report of Consultation, 11 September 2000.



### Current Practice Summary Table continued...

Recent and Current Practice	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>5. Client classification studies using dependency data items as splitting variables for assignment of clients to classes</b>				
5.1 Community Home Nursing Groups Studies, (1995-8) <sup>39</sup> .	National community nursing casemix development project and validation study	Analyses 6000 complete and incomplete episodes with costs as main DV used in study	Data on dependency levels on CH nursing clients, related to nursing goals and activities. Katz scores used for dependency.	Describes a range of service variables, including service intervention types, nursing goal as well as client variables such as case types, and functional dependency measured by items on eating, dressing and bathing and the Katz scores. *
5.2 Royal District Nursing Service Victoria (RDNS) Casemix study (1996) <sup>40</sup> .	Validation study of Community Home Nursing Groups classes	Analysis of episodes- all RDNS clients	Study of 1523 and 841 episodes, used Katz ADL scores as splitting variable	Looked at dependency (ADLs) in 12 HACC client classes, the 49 CHNG classes and 9 client/nursing goal classes. *
5.3 RDNS Victoria Carer Needs Assessment (2000)	Tool for looking at carer needs.	Includes assistance in ADL, service support, social support	About 90 items on form – to be used as required – not part of a regular info. system	Uses tick box format and text fields, eg ADL assistance daily, 1/wk, less often, other domains have Y/N, various time measures, service support needed has seven-point scale.
5.4 Domiciliary Care Service South Australia <sup>41</sup>	Casemix –style development study	Analysis of episodes for SA Dom. Care service clients	Study of 14,600 clients test of reliability of different tools including Barthel.	Study looking for associations between 41 potential explanatory variables. Strongest association to costs was Barthel score. *
5.5 Silver Chain Western Australia <sup>42</sup> .	Community Care Costing Study	Community care clients 1977 episodes metro and country.	Developed Nursing Intensity and Complexity Index (NICI).	Low moderate and high scores on NICI are highly agency dependent. The study tested a range of standard functional measures to look at their relationship to service costs . *

<sup>39</sup> Donnelly, C et al. Community Home Nursing Groups. Report on the Australian Community Home Nursing Casemix Development Project, August 1995. Johnson, M et al. Validation of Community Home Nursing Groups and Costweights.

<sup>40</sup> Maddox, J. Casemix Classification in Domiciliary Nursing. Report on the Royal District Nursing Service Casemix Classification Studies. RDNS, Melbourne.

<sup>41</sup> Described in Hindle, D. Classifying the care needs and services received by HACC clients: A Review of the Options. Aged and Community Care Service Development and Evaluation Reports, April 1998, No.33.

<sup>42</sup> Jones, L. Lewin, G. Glasgow, S, Stowell, S and Boakes, J. Silver Chain Community Care Casemix Project. Preliminary Costing Study, Final Report, 20 June 1998. Green J. and Eagar, K. Comments on Silver Chain Community Care Costing Study Methodology, Centre for Health Service Development, University of Wollongong. May, 1998.

### Current Practice Summary Table continued...

Recent and Current Practice	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>5. Casemix type studies using dependency data items as splitting variables for assignment of clients to classes</b>				
5.6 AN-SNAP National classification of sub-acute and non-acute clients. CHSD 1996-2000 <sup>43</sup>	Full classification and costs study across 105 hospital and community settings. (database of 31,000 episodes)	Complete episodes for five client types included in study - palliative care, rehabilitation, psychogeriatric, geriatric evaluation & management (GEM), maintenance care.	Used and tested a range of functional measures related to service costs; RUG-ADL, FIM, Modified Barthel, Behaviour Scale, HoNOS, MMSE.	The resulting software contains various scales that combine into classes through a grouper. National and NSW implementation strategy underway. Links to part of larger CHIME framework. Software development ongoing (SNAPware – SNAPshot V3.1 has SNAP classes linked to data requirements of ACAT, RCS, Pall Care, Mental Health, CIARR, and HACC MDS) *
5.7 National Mental Health classification and costing study - CHSD with others <sup>44</sup> .	Full study across both hospital and CC (18,000) over 22 sites nationally	Examined completed episodes of care for all MH clients. Found evidence for 42 classes (19 in community)	HoNOS, LSP, RUG-ADL, RCI (BS), HoNOSCA, CGAS	MH-CASC contains scales that combine into classes through the use of a grouper. Accepted as national MH classification tool version 1. But note main effect on costs was the service setting, rather than client variables *
<b>6. Background to this project - see also section 3 above</b>				
6.1 National Review of HACC Data Requirements, 1996 <sup>45</sup>	Review of items for inclusion in MDS.	Part of work program for HACC officials	Draft MDS, revised version of Data Dictionary	Prepared draft dependency items. *
6.2 National Framework for Comprehensive Assessment, 1998 <sup>46</sup> .	Review of current practice in structural elements in assessment services	Review of national and international models	Review helped shape national policy directions and propose a structure for assessment services	Describes the range of assessment models and scales in current use up to 1997.

<sup>43</sup> Eagar K. et al. The Australian National Sub-Acute and Non-Acute Patient Classification (SNAP): Report of the National Sub-Acute and Non-Acute Casemix Classification Study. Centre for Health Service Development, University of Wollongong, August 1997. ISBN 0 86418 456 5

<sup>44</sup> Buckingham W et al 1998. Developing a Casemix Classification for Mental Health Services, Volume 1: Main Report. Commonwealth Department of Health and Family Services, Canberra. [www.health.gov.au/hsdd/mentalhe](http://www.health.gov.au/hsdd/mentalhe)

<sup>45</sup> Brian Elton and Associates 1996. National Review of HACC Data Requirements. Final report: Future Directions. Canberra, Commonwealth Dept of Health and Family Services.

<sup>46</sup> Lincoln Gerontology Centre, 1998. National Framework for Comprehensive Assessment in the HACC Program, Melbourne, LGC, La Trobe University

### Current Practice Summary Table continued...

Recent and Current Practice	Aims	Main focus	Functional dependency data items used	Types of scales, special features, comments Relationship to recognised assessment tools, etc
<b>6. Background to this project - see also section 3 above</b>				
6.3 National Review of CIARR, 1999.	Scoping study for a national approach to information sharing.	Review of current work on paper based and electronic info sharing protocols	Description of current electronic data transfer options	The review included recommended new ATSI and NESB items. Unlikely to be long term technical problems in including this work as part of any new dependency items. Suggests no single national is approach likely.
6.4 HACC Data Dictionary, 1998 <sup>47</sup> .	Standardisation of data items	Data model with MDS included	Part of National Information Development work plan.	Development of refined data items and definitions taking place under the framework (managed through AIHW) of the national health data dictionary. *
6.5 HACC Client Classification Projects 1995-1999	Propose development pathway for client classification tools	Framework for introducing classification variables into routine data collection	No specific tools recommended although most current tools considered as part of the reviews	Development pathways including time line, work program and indicative costs proposed in two earlier reports described at section 3.1 above.
6.6 <i>Dependency data items consultancy (CHSD 2000-1)</i>	<i>Advice on preferred measures of dependency. Project started on October 18, 2000. Report May 2001</i>	<i>How best to capture the characteristics of HACC and ACAT clients related to dependency data items</i>	<i>Definition of associated data items for inclusion in the HACC MDS etc. Advice on measurement of client dependency data. Testing of tools.</i>	<i>Aim is to develop and test client dependency data items for current practice, assess validity and reliability issues, in order to improve inter-agency information exchange and streamline reporting across programs. Explore possibility of using a mapping approach.</i>

<sup>47</sup> Commonwealth and State/Territory HACC Officials 1998. HACC Data Dictionary, version 1.0. Canberra, Commonwealth Dept of Health and Family Services. AIHW Work Program 1999-2000 ISBN 1-74024-020-0, AIHW Cat. No. AUS-17

## Attachment 4 Examples of instruments and mapping

**Table 13** *An example of a self-care motor function scale – the motor subscale of the Functional Independence Measure*

	Current	3 month goal	Guide to scoring the FIM Motor score
Eating			<b>NO HELPER</b> Score of 7 - Complete Independence Score of 6 - Modified Independence <b>HELPER</b> Score of 5 - Supervision or setup Score of 4 - Minimal contact assistance Score of 3 - Moderate contact assistance Score of 2 - Maximal contact assistance Score of 1 - Total contact assistance
Grooming			
Bathing			
Dressing Upper Body			
Dressing Lower Body			
Toileting			
Bladder Management			
Bowel Management			
Transfer - Bed/chair/wheelchair			
Transfer toilet			
Transfer Tub/shower			
Walk/Wheelchair			
Stairs			
MOTOR SUB-SCALE (total)			

**Table 14** An example of an instrumental function scale – the Lawtons IADL scale

Item number	Item name	Score	Task
A	Telephone	1	Operates telephone on own initiative - looks up and dials numbers etc
		2	Dials a few well-known numbers
		3	Answers telephone but does not dial
		4	Does not use telephone at all
B	Shopping	1	Takes care of all shopping needs independently
		2	Shops independently for small purchases
		3	Needs to be accompanied on any shopping trip
		4	Completely unable to shop
C	Food preparation	1	Plans, prepares, serves adequate meals independently
		2	Prepares adequate meals if supplied with ingredients
		3	Heats and serves prepared meals, or prepares meals but not does maintain adequate diet
		4	Needs to have meals prepared and served
D	Housekeeping	1	Maintains house alone or with occasional assistance
		2	Performs light daily tasks eg dishwashing, bed-making
		3	Performs light daily tasks but cannot maintain acceptable standards of cleanliness
		4	Needs help with all home maintenance tasks
		5	Does not participate in any housekeeping tasks
E	Laundry	1	Does personal laundry completely
		2	Launders small items - rinses socks, stockings etc
		3	All laundry must be done by others
F	Mode of transportation	1	Travels independently on public transportation or drives own car
		2	Arranges own travel via taxi but does not otherwise use public transport
		3	Travels on public transportation when assisted or accompanied by another
		4	Travel limited to taxi or automobile with assistance of another
		5	Does not travel at all
G	Responsibility for own medications	1	Responsible for taking medications in correct dosage at correct time
		2	Takes responsibility if medication is prepared in advance in separate dosages
		3	Is not capable of dispensing own medication
H	Ability to handle finances	1	Manages financial matters independently (budgets, writes cheques, pays rent, bills, goes to bank), collects and keeps track of income
		2	Manages day-to-day purchases, but needs help with banking, major purchases etc
		3	Incapable of handling money

**Table 15** *Items and scores for 4 different motor function scales in common use*

Item	FIM	Modified Barthel	Victorian modified Barthel	RUG-ADL
Eating	1 to 7	0 to 10	0 to 6	3 to 1
Drinking	na	na	0 to 4	na
Grooming	1 to 7	0 to 5	0 to 5	na
Bathing	1 to 7	0 to 5	0 to 4	na
Dressing Upper Body	1 to 7	na	0 to 5	na
Dressing Lower Body	1 to 7	na	0 to 5	na
Put on brace/artificial limb	na	na	0 to 2*	na
Dressing	na	0 to 10	na	na
Toileting	1 to 7	na	0 to 4	5 to 1
Bladder Management	1 to 7	0 to 10	0 to 10	na
Bowel Management	1 to 7	0 to 10	0 to 10	na
Transfer-Bed/Chair/Wheelchair	1 to 7	0 to 15	na	5 to 1
Bed mobility	na	na	na	5 to 1
Transfer-Toilet	1 to 7	0 to 10	0 to 6	na
Transfer-Tub/Shower	1 to 7	na	0 to 1	na
Transfer-Chair	na	na	0 to 15	na
Walk/ Wheelchair	1 to 7	0 to 15	0 to 15	na
Stair	1 to 7	0 to 10	0 to 10	na
Comprehension	1 to 7	na	na	na
Expression	1 to 7	na	na	na
Social interaction	1 to 7	na	na	na
Problem Solving	1 to 7	na	na	na
Memory	1 to 7	na	na	na
MINIMUM SCORE	18	0	0	18
MAXIMUM SCORE	126	100	102*	4

**Explanatory notes:**

numbers in each column

na

minimum score

maximum score

\*

range of possible scores for each item. First number listed is lowest function, second is highest function

not applicable - this item is not included in relevant scale

lowest possible score - person has low level of function

highest possible score - person is independent

in Victorian modified version, maximum score of 102 only possible if person requires help with brace/artificial aid. Maximum score possible for people without brace/artificial aid or people unable to fit brace/artificial aid is 100

**Table 16** Total score mapping of 3 instruments

<b>Barthel</b>	<b>FIM Motor</b>	<b>RUG-ADL</b>
100	85	4
95	82	4
90	78	5
85	73	6
80	71	6
75	69	7
70	67	8
65	64	9
60	59	10
55	54	11
50	51	12
45	47	12
40	43	13
35	40	14
30	35	15
25	33	16
20	31	16
15	27	16
10	25	17
5	21	18

**Table 17**      **An example of score mapping at the item level – the AGS and the FIM**

<b>Item</b>	<b>AGS Score</b>	<b>FIM Mapping</b>
Mobility	0 Not Known/ Relevant, 1 Walks Independently, 2 Does Not Walk Independently	Mapping from FIM Walk/Wheel item. Score of 1 to 5 = not independent, Score of 6 or 7 = independent. If no FIM score = not known/relevant
Urinary Continence	0 Not Known/ Relevant, 1 Completely Continent, 2 Not Completely Continent.	Mapping from FIM Bladder Management Score of 1 to 5 = not completely continent, Score of 6 or 7 = completely continent. If no FIM score = not known/relevant
Faecal Continence	0 Not Known/Relevant, 1 Completely Continent, 2 Not Completely Continent.	Mapping from FIM Bowel Management Score of 1 to 5 = not completely continent Score of 6 or 7 = completely continent. If no FIM score = not known/relevant.



## **Attachment 5: Review of literature on screening instruments and questions**

### **A5.1 Introduction**

There is substantial diversity in the health status and needs of clients receiving support from services in the HACC program. While some would benefit from a comprehensive assessment, for others this would be an unnecessary burden and intrusion. Consequently, it is generally recognised that a two-stage (or multi-stage) problem identification and assessment system is required to ensure comprehensive assessments are preformed only on clients that are likely to benefit from them.

As with comprehensive assessment, it would be desirable if a standard approach, based on the available evidence, were adopted in the initial problem identification process. Doing so would be expected to enhance the consistency and reliability with which the initial needs of a client are identified. (HMOWCM, 1996) Moreover, there is reason to believe that current practices of needs identification might be improved by the adoption of a more formal process of measuring function. Various studies have reported that clinical judgement was poor in detecting moderate impairments which are fairly prevalent in older people living in the community (Byles 2000; Maly et al. 1997). It has also been noted that needs and levels of dependency can change quickly, especially in the elderly (Tinnetti 1995), something that also suggests a need for regular, formal screening procedures.

In this section of the report, the availability and validity of screening instruments and questions are discussed. It summarises the current evidence as found by a literature search of the following abstracting databases: Citations in Nursing and Allied Health (CINAHL), Psychology Literature (PsychLit) and the Medical Data Base (Medline). The review also made use of relevant reports, notably two reports published by the American Association of Health Plans (AAHP) Foundation. Both reports, "Risk screening Medicare members revisited" and "Planning care for high-risk medicare HMO members" were written by the HMO Workgroup on Care Management.

### **A5.2 Role of a screening instrument**

There are a variety of roles for which a screening instrument can be designed. They can be designed to identify people at high-risk of specific hazards or diseases (for example, a high risk of falling) or to identify people at more general, multiple risks (for example, a high risk of admission to hospital). Not all such screens will be relevant to HACC services, and to the issue of measuring dependency. Nonetheless, it is necessary to consider what roles have been advocated for the use of screening instruments. In this discussion, the term screening instrument will be used to refer to a instrument containing one or more screening questions. It is not being used to cover medical screening or diagnostic tests.

In general, there are two forms of questions that might be included in a screening instrument. The first type is concerned with determining appropriate care for someone. It might be concerned with (among other things):

1. improving the accuracy with which need is identified;
2. improving access to appropriate treatment by determining risk and setting priorities;
3. improving prognosis;
4. restoring, maintaining and functional autonomy;
5. determining eligibility for services.

The second type of question is related to identifying factors that might affect the delivery of care. For example, the propensity of someone to exhibit violent behaviour is likely to influence staffing arrangements.

As this report is concerned with dependency, the literature review concentrated on screening instruments that focused on its measurement. However, dependency would not necessarily limit the variety or definition of the second type of questions included in a screen. Consequently, the main criterion used in determining which screens were included in this review was the appropriateness of the questions to the setting of the services and the likely characteristics of the target population. In other words, whether or not the questions of the second type were likely to apply to people living in the community.

A key element in considering the role of a screen is to examine what the screen was designed to achieve. Broadly speaking, the purpose of a screen is to identify patients at high risk, but “high risk” can be interpreted in various ways. For example, each of the following screens included one or more items that measure function (eg. ADL, IADL) but had a different purpose:

1. the Pac was designed to identify clients who were at high risk of “additional costs”, ie. more than US\$1000 in the following year (HMOWCM 1996);
2. Brody et al. (1997) developed a tool for predicting which elderly community clients were at risk of frailty in the subsequent year (eg. entry into a nursing home);
3. Maly et al. (1997) developed a screen to detect geriatric syndromes in the community dwelling elderly who would benefit from comprehensive geriatric assessment.

The effectiveness of different roles that a “functional status” screen could play in the delivery of HACC services would not appear to have been clearly formulated in policy documents as yet, nor evaluated by researchers. Further research in this area would therefore appear warranted. However, considerations about screening and assessment in general practice highlight several issues that would also apply to HACC services.

In its reconsideration of screening strategies for identifying high-risk older adults, the HMO Workgroup on Care Management interpreted high risk in relation to (1) functional status decline and (2) health resource utilisation (HMOWCM 2000). The workgroup argued that screening strategies should focus on those risks that are potentially modifiable and for which effective interventions are known. A similar view was expressed by Moore et al. (1996) arguing that physicians may have difficulty translating information on broad concepts of function rather than specific clinical problems that may affect function, or into specific interventions to improve functioning.

The HMO workgroup also considered screening and assessment as conceptually distinct, stating that screening should identify high risk people, while assessment should determine whether or not an individual required services or case management. Moreover, the workgroup argued that screening should not lead directly to an intervention but rather to an assessment of whether an intervention was needed. This view probably reflects various practical considerations that favour a two (or multi) stage approach. Most importantly, a screening question, due to its simplicity, is likely to label as “in need” many people who may not actually require an intervention. Thus, it is beneficial to the patient as well as probably being more cost-effective to have a comprehensive assessment, with higher sensitivity, follow a positive screen.

Finally, a corollary to the fact that “high risk” can be interpreted in different ways is that screens that embody different interpretations are likely to identify different (though perhaps overlapping) sub-groups within a population as high risk. People with functional impairments at high-risk of hospitalisation may not be the same as those at high-risk for functional decline (HMOWCM, 2000). Moreover, a tool that predicts increased resource utilisation may not assist in implementing strategies to reduce cost. For example, the HMO workgroup noted that one tool aimed at predicting increase risk of repeated hospitalisation (the Pra) may not identify avoidable hospitalisations (HMOWCM, 2000).

### **A5.3 Domains that appear to be important for screening**

There would appear to be no universally accepted set of domains that a screening instrument for dependency should cover, either generally or for screens designed for specific purposes. This is perhaps not surprising given that there is no universally accepted theoretical model of disability or functional loss, or even clear definitions of these concepts (Stuck et al. 1999). Instead, the screening instruments found by the literature search seem to be designed based on practice informed expert opinion and/or empirical studies. Moreover, all articles located focussed on the screening/assessment of the elderly.

There were several articles that reflected different approaches to try and unify what domains a screen or assessment should cover but, unfortunately, none were restricted to HACC services or their overseas equivalent. Those related to screening people living in the community had a broader focus that included primary care services as well. Of these, one article provided an example of a consensus based approach; a group of European experts in health and social care met a consensus conference (sponsored by the WHO) with the aim of agreeing a standardised medical and social assessment (Philp, 1997). Another article referred to the development of a tool in order to meet new legislative requirements in the UK. The legislation introduced a compulsory annual health check for people aged over 75 by their GP (Donald 1997). The domains seen as important in both articles are outlined below: Both can be seen to cover aspects relevant to the screening of people for dependency and/or obtaining information relevant to the delivery of care.

EU Consensual conference domains (Philp 1997)	Legislative requirements for UK GPs (Donald 1997)
Perceived and well-being Individual needs, goals and satisfaction with care Confusion, behaviour and depression Vision, reading, hearing and chewing Instrumental and personal activities of daily living Housing finance and carer	Sensory function Mobility Mental condition Physical condition Continence Social environment Use of medicines.

The above sets of domains highlight an important issue relevant to the role of screening for dependency. The included domains can be seen to extend beyond pure measures of functional status (ie. activities of daily living (ADLs), mobility and instrumental ADLs (IADLs)). One weakness with only including measures of function in a screen is the apparent difficulty in linking these domains to a particular screening goal or to the instrument's role. For example, the HMO Workgroup on Care Management gave a preliminary list of items for inclusion in a screen when an important design consideration was whether or not there were effective interventions for the people being screened and identified as high risk (HMOWCM 2000). The items were only partially related to functional status and included:

- physical inactivity;
- depression;
- falls history;
- urinary incontinence;
- medications (poly-pharmacy);
- under nutrition.

Another reason that proposed sets of domains extend beyond measures of function is that there are making factors associated with functional decline. A systematic literature review by Stuck et al. (1999) reviewed 78 longitudinal studies published between 1985 and 1997 that reported statistical associations between risk-factors and subsequent functional decline in the elderly living

in the community. Although the usefulness of the review is limited because it did not consider which risk factors are potentially modifiable, it provided evidence linking functional status decline to a range of factors and domains. The strongest evidence for an increased risk was found for:

- disease burden (number of co-morbidities);
- increased or decreased body mass index;
- low level of physical activity;
- reduced observed lower extremity function;
- cognitive impairment;
- depression;
- low frequency of social contacts;
- poor self perceived health;
- smoking;
- no alcohol consumption compared to moderate consumption; and
- poor self-reported vision.

There was weaker evidence linking functional decline to high medication use and a history of multiple falls. But the authors noted that the lack of evidence for some other domains was not an indication of no association, as several domains had not been investigated adequately in the literature, notably nutritional status, social support and physical environment.

Thus, in summary, the current published literature has very little direct evidence to direct the adoption of a screen suitable for HACC services. As highlighted in the previous section, there are various roles that can be envisaged for a screen in HACC services, which are justifiable because of considerations from models of good practice. However, there is little evidence to inform how to implement a screen developed within this framework or to suggest what the various minimum performance standards need to be. There is some evidence about what domains a screen should cover from studies of screening in primary care services of elderly people living in the community. However, the notable feature of this is the inclusion of domains beyond the standard measures of function. While some of these are related to questions related to the delivery of services (type 2 questions), others are concerned with determining the appropriate care for someone. This issue of including items in a screen that are (modifiable) risk factors of functional decline as well as measures of function is beyond the scope of this project. Nonetheless, it would seem to be an issue that warrants further consideration.

#### **A5.4 Screening instruments**

In this section, the characteristics of instruments that were judged to have potential as a screening tool are examined. The review found a number of instruments but not all were appropriate or suitable for the anticipated role of a screen in the context of HACC services (ie. screens that were not designed for use by community services or use on individuals living in the community). In addition, others predominantly measured risk factors associated with functional decline rather than function per se. It was assumed that a screen in the context of this particular project should focus on measuring functional status. Thus, screens that did not conform to these criteria were not examined in detail. The types of screens not covered included:

- screens focussed on a single or narrow range of factors, like the likelihood of a person having a serious fall;
- screens designed to predict resource use, hospitalisation or entry into a nursing home;
- screens designed to assist discharge planners identify the care needs of inpatients after discharge;
- screens designed for use in epidemiological studies to measure the prevalence of particular conditions that focussed primarily on medical conditions rather than function.

Table 18 lists the screening instruments considered in this review. A number of points for consideration are highlighted below.

- There is variation in the purpose for which the screening tools were designed. Some were developed to improve the assessment of patients by their general practitioner. Only one was specifically developed as a screen for people who might benefit from comprehensive assessment, though the 5-item IADL scale proposed by Fillenbaum could also fulfil this role.
- Administration of the instruments was typically quick, but the method of application differed. Information may be obtained by observation (eg. The Rapid Disability Rating Scale-2), or by interview of carer or client (eg. Elderly at risk rating scale) or by self-report by the client (eg. screen of Maly et al.). The utility of those scales that require administering by observation is limited in the HACC arena, as they could not be administered by phone.
- It is unclear how much training in the application of any instrument was required. It would seem that only minimal training is necessary in some cases (eg. RDRS-2) and it is possible that the screens derived from the OARS ADL and IADL sub-scales would not require as much training as administering the complete OARS instrument. However, clarification by the authors or further testing is necessary to confirm this.
- All instruments included ADL and/or IADL items to a greater or lesser degree. Three screens also cover other domains. Some domains are related to dependency, like cognitive impairment, but most are related to either risk factors associated with functional decline eg. falls history or questions that might influence decisions about the delivery of care (resisting care). As such, these three screens might be considered to extend beyond the boundaries of the current project. Table 19 lists the content of the screens in detail.
- While the screens are reasonably brief, it is worth noting that the two focussing exclusively on ADL and IADL are not much shorter than a screen combining the recommended ADL and IADL scales (Barthel ADL and Lawton's IADL scale). Thus, if a screen was required that covered ADL and IADL items extensively, it might be better to construct a screen from the recommended scales.
- Evidence of reliability and validity vary across the scales. Those derived from the OARS instrument can be assumed to be reasonably valid because of the extensive testing on the parent tool, although ideally this is not an acceptable substitute. For others, evidence of validity and reliability is limited, often only being provided by the studies proposing the use of the screens. Thus, the screen's utility in other populations remains unknown. The use of the screens in clinical practice would also seem to be limited and it is unclear whether the screens would result in better care or are cost-effective.

**Table 18 Summary of instruments that could be used as screening tools**

	<b>Elderly at risk rating scale (EARRS)</b> (Donald 1997)	<b>Rapid Disability Rating Scale 2 (RDRS-2)</b> (Linn and Linn 1982)
Purpose	To meet the requirements for assessment in people over 75 years	Developed as a research tool to summarise the functional abilities and mental status of older patients in institutions or the community
Usage	Limited. Only reported use is article describing validation.	
Application	Completed by a nurse. Duration of interview, 10-15 minutes	Observation (not self-report) by person familiar with patient. 2 min to complete after observation.
Items	12 items on physical risk, including falls history, some ADL items, drug use, vision and hearing. 4 items on mental risk, including depression, and 4 items on social risk	18 questions: 8 on ADL; 3 on sensory capacity; 3 on mental capacity; one each on diet, continence, medication and confinement to bed.
scoring/ interpretation	18-items scored on a five point scale; 2 scored on a 3 point scale. Scale contents changes with questions.	4 levels for each activity. Items are equally weighted. Possible to use total scores: from 18 (independent) to 72 (most dependent) or 3 sub-scores for ADL, physical disabilities and psycho-social problems
Reliability	Scoring by nurses and doctors similar.  Test-retest reliability at 1 week interval for individual questions was good, all kappa values above 0.75, though small sample.	Inter-rater (RDRS-1) Kendall's index 0.91 (Linn 1967)  Test-retest (RDRS-1) >0.8 (Linn 1967) Item correlations 0.62-0.98 (Linn and Linn 1982)
Validity	Compared to Barthel, though this only corresponds to 10-items in EARRS. EARRS suffers less from ceiling effects and is sensitive to change when compared to the Barthel.	3 factors identified on factor analysis - assistance with ADL, degree of disability, degree of special problems. (Linn and Linn 1982)  Predictive validity evidenced for mortality (Linn and Linn 1982).  Correlation with physicians ratings - low (0.27) (Linn and Linn 1982)
Comments	EARRS based on the Winchester Disability Scale. This scale was tested in a controlled trial and the improved surveillance was found to reduce falls and days in hospital. (Carpenter and Demopoulos 1990)	

### Summary of instruments that could be used as screening tools (cont-d)

	<b>Screen for identifying elderly community residents with impaired function</b> (Fillenbaum 1985)	<b>Screen for selecting people for comprehensive geriatric assessment</b> (Maly et al. 1997)
Purpose	To provide a brief screen based on IADL performance to identify elderly community residents with impaired function to better target services.	To detect geriatric syndromes in community dwelling older people who would benefit from outpatient comprehensive geriatric assessment
Usage	No evidence of screen being used provided, but notes that the OARS questionnaires have been extensively used	Unclear. Appears limited
Application	Screen would appear to be brief (<5 minutes). Claimed to be easy to administer, no indication of training /skills needed given. The complete OARS questionnaire, the scale is administered by trained interviewer, but the items can also be self-administered.	Questionnaire completed by participant. 16 screening questions completed in 5 minutes. Complete questionnaire which included another 19 questions on demographics took on average 11 minutes to complete.
Items	5 items for IADL: transportation, shopping, meal preparation, housework, and managing finances.	16 screening questions. 3 items on ADL, 6 items on IADL, 3 items on social activities and questions for depression, falls and urinary incontinence. ADL, IADL and social activity items taken from the Functional Status Questionnaire (Jette et al. 1986)
Scoring/ interpretation	Subjects rated as either having or not requiring help. Summing the number of activities that can be performed unaided produces a Guttman 6-point scale.	ADL, IADL and social activity items scored on a 5-point scale, and combined to give a score indicating functional impairment. Cut-offs indicating impairment were defined by an expert clinical panel, being 89 for ADL, 72 for IADL and 78 for social activities.  Items on depression, falls and incontinence (2-item screen) scored either yes or no.
Reliability	Reliability of items tested in complete OARS. Test-retest reliability for IADL sub-scale reported as 0.71 (Fillenbaum and Smyer 1981). Inter-rater and intra-rater reliability of various subscales ranged from 0.67-0.87 (Fillenbaum and Smyer 1981).	Reliability was not assessed by Maly et al. (1997)  Internal consistency (Cronbach's alpha) for the ADL, IADL and social activities sub-scales reported as 0.77, 0.87 and 0.75 (Einarsson et al. 1990)
Validity	Individual items taken from OARS IADL scale which has been extensively validated. 5-item Guttman scale correlated to social and physical health summarised on a six point scale (unclear what measured), respectively 0.54 and 0.55 for people aged 65 plus. Also reported as having predictive validity for survival 1 year later, an inverse relationship.	Using outcome of comprehensive assessment as a gold standard, sensitivity and specificity for depression screen were 93% and 66%; for urinary incontinence were 66% and 97%, for falls were 86% and 66% and for functional impairment was 90% and 53%. (Maly et al. 1997)
Comments	Fillenbaum notes the potential for a screen based on IADL items to be culturally sensitive but suggests that the items chosen are culturally fair.	

### Summary of instruments that could be used as screening tools (cont-d)

	<b>Screen used in the Canadian Study of Health and Aging</b> (Thomas et al. 1998)	<b>Groningen Activity Restriction Scale (GARS)</b> (Suurmeijer et al. 1994)
Purpose	To measure functional status in a Canadian study that surveyed elderly people to determine the prevalence of dementia and Alzheimer's disease.	To measure functional status in both ADL and IADL in studies of elderly or chronically ill people living in the community
Usage	Specific screen limited to study.	Unclear. Appears limited to research studies rather than clinical practice.
Application	No information provided, but presumably it can be administered in the same way as the complete OARS instrument.	No information provided. Appears to be brief and possibly self rated.
Items	14 items from OARS, modified slightly. 7 ADL and 7 IADL. A single question was substituted on "use of the bathroom" for the two OARS questions regarding continence.	18 items: 11 on ADL, 7 items on IADL. Items rated on what they are able to do not on their actual performance.
Scoring/ interpretation	Subjects rated on a 3-point scale: independent, some help, completely dependent.	All items scored on a 5-point scale from fully independent, independent but have difficulty (2 of), need some help, fully dependent.
Reliability	Reliability of items tested in complete OARS. Test-retest reliability for ADL and IADL sub-scale reported as 0.82 and 0.71 respectively (Fillenbaum and Smyer 1981). Inter-rater and intra-rater reliability of various subscales ranged from 0.67-0.87 (Fillenbaum and Smyer 1981).	Internal consistency (Cronbach's rho) for the ADL, IADL and complete scale reported as 0.90, 0.89 and 0.94 respectively.
Validity	OARS ADL and IADL scale which has been extensively validated. (see Table 4)	Reported high correlation with the Nottingham Health Profile (ADL 0.77, IADL 0.71, overall 0.78) but less correlated with Karnofsky Physical Status Scales the overall evaluation of health and the Somatic Symptoms sub-scale from the General Health Questionnaire (GHQ-SS)
Comments	Perhaps of limited potential as the scale has not been used as a screen in clinical practice. Potentially useful as it covers both ADL and IADL dimensions of function.	Perhaps of limited potential as the scale has not been used as a screen in clinical practice. Potentially useful as it covers both ADL and IADL dimensions of function.



**Table 19** Content of reviewed screening instruments

		Scale/ screen					
Dimension		EARRS	RDRS-2	5-item OARS screen	Maly et al. screen	14-item OARS screen	GARS
<i>Physical Function</i>							
ADL:	bowels		+				
ADL:	bladder	+	+		+		
ADL:	grooming		+			+	
ADL:	get on/off toilet	+	+			+	+
ADL:	feeding					+	+
ADL:	transfer				+	+	+
ADL:	mobility	+	+		+	+	+
ADL:	dressing	+	+			+	+
ADL:	stairs						+
ADL:	bathing	+				+	+
ADL:	other		in bed during day				foot care
IADL:	finances		+	+		+	
IADL:	shopping		+	+	+	+	+
IADL:	meal preparation			+		+	+
IADL:	housework		+	+	+	+	+
IADL:	mobility outdoors	+			+	+	+
IADL:	transport use			+			
IADL:	telephone use					+	
IADL:	medication		+			+	
IADL:	other				physical activity		washing
<i>Medical problems</i>							
	Falls history	+			+		
	Medication use	+					
	Other	joint pain, blood pressure, foot care					
<i>Communication</i>							
	hearing	+	+		+		
	vision	+	+		+		
	can express self		+				
<i>Nutritional status</i>							
		+	+				
<i>Mental status</i>							
	Depression	+	+		+		
	Cognition	confusion	confusion				
	Behaviour	apathy	resisting care				
<i>Social function</i>							
		living arrangements, carer support			social/ emotional isolation		
<i>Other</i>		suitable housing			able to be a carer		

## A5.5 Conclusion

For various reasons, there would not appear to be a reliable and validated screening instrument for use in the HACC services, whose use has been evaluated in that context. The literature search identified six screens that measured functional dependency and that would seem to be relevant for use on community dwelling individuals. However, each one has limitations.

- the Rapid Disability Rating Scale (RDRS-2) rates people based on observation and is so not suitable for administration by telephone;
- the EARRS and RDRS-2 scales include predominantly more ADL than IADL items. As ADL functions are lost last, this suggests that the scales might have a ceiling effect if used in community dwelling individuals;
- the EARRS, RDRS-2 and Maly et al. screen include items that are not within the realm of functional impairment, and so are perhaps outside the scope of this project;
- the length of the 14-item OARS screen and the 18-item GARS scale is such that they are effectively equivalent to a screen consisting of the Barthel ADL and Lawton's IADL, the two recommended scales for measuring physical function;
- the 5-item OARS screen, seemingly the most appropriate of the six reviewed, has not been evaluated as to its effectiveness identifying patients for further assessment or in need of services.

## References

- Ageing and Disability Department. (1998). "The 1998 HACC User Characteristics Survey: New South Wales, Summary of Findings Report." , Ageing and Disability Department.
- Ainslie, N. K., and Murden, R. A. (1993). "Effect of education on the clock drawing dementia screen in non-demented elderly persons." *Journal of American Geriatric Society*, 41, 249-52.
- Albert, M., Smith, L. A., Scherr, P. A., et al. (1991). "Use of brief cognitive tests to identify individuals in the community with clinically diagnosed Alzheimer's disease." *International journal of Neuroscience*, 57, 167-178.
- Asberg, K. (1987). "Disability as a predictor of outcome for the elderly in a department of internal medicine." *Scand J Soc Med*, 15, 261-265.
- Barberger-Gateau, P., Commenges, D., Gagnon, M., Letenneur, L., Sauvel, C., and Dartigues, J. F. (1992). "Instrumental activities of daily living as a screening tool for cognitive impairment and dementia in elderly community dwellers." *Journal of the American Geriatric Society*, 40, 1129-1134.
- Barer, D., and Nouri, F. (1990). "Measurement of activities of daily living." *Clinical Rehabilitation*, 3, 179-187.
- Barer, D., and Murphy, J. (1993). "Scaling the Barthel: a 10 point hierarchical version of the activities of daily living index for use with stroke patients." *Clinical Rehabilitation*, 7(4), 271-217.
- Beck, A. T., Ward, C. H., Mendelson, M., et al. (1961). "An inventory for measuring depression." *Archives of General Psychiatry*, 4, 561-571.
- Beck, A. T., Steer, R. A., and Garbin, M. G. (1988). "Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation." *Clinical Psychological Review*, 8, 77-100.
- Benjamin, J. (1976). "The Northwick Park ADL index." *British Journal of Occupational Therapy*, 39, 301-306.
- Beresford, T. P., Holt, R. E., Hall, R. C. W., et al. (1985). "Cognitive screening at the bedside: usefulness of a structured examination." *Psychomatics*, 26, 319-324.
- Blessed, G., Tomlinson, B. E., and Roth, M. (1968). "The association between quantitative measures of dementia and of senile change in the cerebral grey matter of elderly subjects." *British Journal of Psychiatry*, 114, 797-811.
- Bowling, A. (1991). *Measuring Health*, Open University Press, Buckingham.
- Brink, T. L., Yesavage, J. A., Lum, O., et al. (1982). "Screening tests for geriatric depression." *Clinical Gerontology*, 1, 37-43.
- Brink, T. L., Curran, P., Dorr, M. L., et al. (1983). "Geriatric Depression Scale reliability: order, examiner and reminiscence effects." *Clinical Gerontology*, 2(57-60).
- Brink, T. L. (1989). "Proper scoring of the Geriatric Depression Scale." *Journal of the American Geriatric Society*, 37, 819-820.
- Brody, K. K., Johnson, R. E., and Ried, L. D. (1997). "Evaluation of a self-report screening instrument to predict frailty outcomes in aging populations." *The Gerontologist*, 37(2), 182-191.
- Bronsson, B., and Asberg, K. (1984). "Katz Index of independence in ADL: reliability and validity in short-term care." *Scand J Rehabil Med*, 16, 125-132.
- Burns, A., Lawlor, B., and Craig, S. (1999). *Assessment Scales in the elderly*, Martin Dunitz Ltd, London.
- Byles, J. E. (2000). "A thorough going over: evidence for health assessment for older persons." *Australian and New Zealand Journal of Public Health*, 24(2), 117-123.
- Carpenter, G. I., and Demopoulos, G. R. (1990). "Screening the elderly in the community: controlled trial of dependency surveillance using a questionnaire administered by volunteers." *British Medical Journal*, 300, 1253-1256.
- Chong, D. (1995). "Measurement of Instrumental Activities of Daily Living in stroke." *Stroke*, 26(6), 1119-1122.
- Cole, M. G. (1990). "Interrater reliability of the Blessed Dementia Scale." *Canadian Journal of Psychiatry*, 35, 328-330.
- Collin, C., Wade, D., Davies, S., and Horne, V. (1988). "The Barthel ADL Index: a reliability study." *International Disability Studies*, 10, 61-3.
- Commonwealth Department of Health and Aged Care. (2000). "Home and Community Care (HACC) Program." , Commonwealth Department of Health and Aged Care.
- Cwikel, J., and Richie, K. (1988). "The short GDS: evaluation in a heterogeneous, multilingual population." *Clinical Gerontology*, 8, 63-71.
- Davis, P. B., Morris, J. C., and Grant, E. (1990). "Brief screening tests versus clinical staging in senile dementia of the Alzheimer type." *Journal of American Geriatric Society*, 38, 129-35.

- Department of Health, Housing and Community Services. (1992). *HACC User Characteristic Survey 1990*, Australian Government Publishing Service, Canberra.
- Donald, I. (1997). "Development of a modified Winchester Disability scale - the elderly at risk rating scale." *Journal of Epidemiology and Community Health*, 51, 558-563.
- Donaldson, S., Wagner, C., and Gresham, G. (1973). "A unified ADL evaluation form." *Archives of Physical Medicine and Rehabilitation*, 54(175-179).
- Duke University Center for the Study of Ageing and Human Development. "SOS Profile. The Duke Long Term Care Service and Outcome screen." , Duke Long Term Care Resources.
- Duke University Center for the Study of Ageing and Human Development. (2000). "OARS: The Method and its Uses." , Duke University Center for the Study of Ageing and Human Development.
- Ebrahim, S., Nouri, F., and Barer, D. (1985). "Measuring disability after stroke." *Journal of Epidemiology and Community Health*, 39, 86-9.
- Einarsson, G., and Grimby, G. (1990). "Disability and handicap in late poliomyelitis." *Scand J Rehabil Med*, 22, 1-9.
- Feinstein, A., Josephy, B., and Wells, C. (1986). "Scientific and clinical problems in indexes of functional disability." *Annals of Internal Medicine*, 105, 413-420.
- Fillenbaum, G. G. (1980). "Comparison of two brief tests of organic brain impairment, the MSQ and the Short Portable MSQ." *Journal of American Geriatric Society*, 28, 381-384.
- Fillenbaum, G., and Smyer, M. (1981). "The development, validity and development of the OARS multidimensional assessment questionnaire." *Journal of Gerontology*, 36(4), 428-434.
- Fillenbaum, G. (1985). "A brief Instrumental Activities of Daily Living." *Journal of the American Geriatrics Society*, 33(10), 698-706.
- Fillenbaum, G. G., Heyman, A., Wilkinson, W. E., et al. (1987). "Comparison of two screening tests for alzheimer's disease: the correlation and reliability of the Mini-Mental State Examination and the modified Blessed Test." *Archives of Neurology*, 44, 924-927.
- Fillenbaum, G., Heyman, A., Williams, K., et al. (1990). "Sensitivity and specificity of standardised screens of cognitive impairment and dementia among elderly black and white community residents." *International Journal of Epidemiology*, 43, 651-660.
- Fillenbaum, G. (2000). "Use of the OARS." , Duke University.
- Fine, M. (1992). *Community Support Services and their users. The first eighteen months*, Social Policy Research Centre, University of New South Wales, Sydney.
- Folstein, M. F., Folstein, S. E., and McHugh, P. R. (1975). "'Mini-Mental State': a practical method for grading the cognitive state of patients for the clinician." *Journal of psychiatric research*, 12, 189-198.
- Foreman, M. D. (1987). "Reliability and validity of mental status questionnaires in elderly hospitalized patients." *Nursing Research*, 36, 216-20.
- Forer, S., and Miller, L. (1980). "Rehabilitation Outcome: comparative analysis of different patient types." *Arch Phys Med Rehabil*, 61, 359-365.
- Forer, S. (1981). *Revised functional status rating instrument*, Rehabilitation Institute, Glendale Adventist Medical Center, Glendale, California.
- Fries, J. F., Spitz, P., Kraines, R. G., et al. (1980). "Measurement of patient outcomes in arthritis." *Arthritis Rheum*, 23, 137-145.
- Gallagher, D., Nies, G., and Thompson, L. W. (1982). "Reliability of the Beck Depression Inventory with older adults." *Journal of consulting and clinical psychology*, 50, 152-153.
- Geoghegan, A. (2000). "Kenny Self-care Evaluation." , Sister Kenny Rehabilitation Institute.
- George, L., and Fillenbaum, G. (1985). "OARS Methodology. A decade of experience in Geriatric Assessment." *Journal of the American Geriatrics Society*, 33(9), 607-615.
- Gladman, J., Lincoln, N., and Adams, S. (1993). "Use of the extended ADL scale with stroke patients." *Age and Ageing*, 22, 419-424.
- Gompertz, P., Pound, P., and Ebrahim, S. (1994). "Validity of the extended activities of daily living scale." *Clin Rehabil*, 8, 275-280.
- Granger, C. V., and Greer, D. (1979). "Outcome of comprehensive medical rehabilitation: measurement by PULSES Profile and the Barthel Index." *Archives of Physical Medicine and Rehabilitation*, 60, 145-154.
- Granger, C. V., Hamilton, B. B., and Shewin, F. (1986). *Guide for use of the uniform data set for medical rehabilitation*, Buffalo General Hospital, New York.

- Granger, C. V., Hamilton, B. B., Linacre, J. R., et al. (1993). "Performance profiles of the Functional Independence Measure." *Arch Phys Med Rehabil*, 74, 127-132.
- Gresham, G., Philips, T., and Labi, M. (1980). "ADL status in stroke: relative merits of 3 standard indexes." *Archives of Physical Medicine and Rehabilitation*, 61, 355-358.
- Hodkinson, H. M. (1972). "Evaluation of a mental test score for the assessment of mental impairment in the elderly." *Age and Ageing*, 1, 233-238.
- Holbrook, M., and Skilbeck, C. (1983). "An activities index for use with stroke patients." *Age and Ageing*, 12, 166-170.
- Home and Community Care Working Group. (1988). *The First Triennial Review of the Home and Community Care Program*, Australian Government Publishing Service, Canberra.
- HMO workgroup on Care Management. (1996). "Identifying high-risk Medicare HMO members: a report from the HMO Workgroup on Care Management." The American Association of Health Plans, Washington DC.
- HMO workgroup on Care Management. (2000). "Risk screening medicare members revisited: a report from the HMO Workgroup on Care Management." AAHP Foundation, Washington DC.
- Jacobs, J. W., Bernhard, M. R., Delgado, A., et al. (1977). "Screening for organic mental syndromes in the medically ill." *Annals on Internal Medicine*, 86, 40-46.
- Jette, A. M., Davies, A. R., Cleary, P. D., Calkins, D. R., Rubenstein, L. V., Fink, A., Kosecoff, J., Young, R. T., Brook, R. H., and Delbanco, T. L. (1986). "The functional status questionnaire: reliability and validity when used in primary care." *Journal of General Internal Medicine*, 1, 143-149.
- Juva, K., Makela, M., Erkinjuntti, T., Sulkava, R., Ylikoski, R., Valvanne, J., and Tilvis, R. (1997). "Functional assessment scales in detecting dementia." *Age and Ageing*, 26(5), 393-400.
- Katz, S., Ford, A., Moskowitz, R., and al, e. (1963). "Studies of illness in the aged. The index of ADL: a standardised measure of biological and psychosocial function." *JAMA*, 185, 914-919.
- Katz, S., Downs, T., Cash, H., and al, e. (1976). "A measure of primary sociobiological functions." *International Journal of Health Services*, 6, 493-507.
- Katz, S. (1983). "Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living." *Journal of the American Geriatrics Society*, 3(12), 721-727.
- Katzman, R., Brown, T., Fuld, P., et al. (1983). "Validation of a short orientation-memory-concentration test of cognitive impairment." *American Journal of Psychiatry*, 140, 734-739.
- Kaufman, D. M., Weinberger, N., and Strain, J. J. (1979). "Detection of cognitive deficits by a brief mental status examination: the cognitive capacity screening examination, a reappraisal and a review." *General Hospital Psychiatry*, 1, 247-255.
- Kerner, J., and Alexander, J. (1981). "Activities of Daily Living: reliability and validity of gross vs specific ratings." *Arch Phys Med Rehabil*, 62, 161-166.
- Klein, L. F., Roca, R. P., McAuthor, J., et al. (1985). "Diagnosing dementia: univariate and multi-variate analyses of the Mental State Examination." *Journal of the American Geriatric Society*, 33, 483-488.
- Knight, M. (2000). "Cognitive ability and function status." *Journal of Advanced Nursing*, 31(6), 1459-1468.
- Koenig, H. G., Meador, K. G., Cohen, H. J., et al. (1992). "Screening for depression in hospitalised elderly medical patients: taking a closer look." *Journal of the American Geriatric Society*, 40(1013-1017).
- Last, J. M. (1995). *A Dictionary of Epidemiology*, Oxford University Press, New York.
- Lawton, M., and Brody, E. (1969). "Assessment of Older people: Self-Maintaining and Instrumental Activities of Daily Living." *Gerontologist*, 9, 180.
- Leshner, E. L., and Whelihan, W. M. (1986). "Reliability of mental status instruments administered to nursing home residents." *Journal of consulting and clinical psychology*, 54, 726-727.
- Lincoln, N., and Edmans, J. (1990). "A re-validation of the Rivermead ADL Scale for elderly patients with stroke." *Age and Ageing*, 19, 9-24.
- Lincoln, N., and Gladman, J. (1992). "The extended activities of daily living scale: a further validation." *Disability and Rehabilitation*, 14(1), 41-43.
- Lindmark, B., and Hanrin, E. (1989). "Instrumental activities of daily living in two patient populations, three months and one year after stroke." *Scand J Caring Sci*, 3, 161-168.
- Linn, M. (1967). "A Rapid Disability Rating Scale." *Journal of the American Geriatrics Society*, 15, 211-214.
- Linn, M., and Linn, B. (1982). "The Rapid Disability Rating Scale - 2." *Journal of the American Geriatrics Society*, 30, 378-382.
- Maddox, G. L., and Bratesman, S. (1997). "Pre-assessment screening: an essential building block in LTC information

systems." , Duke Long Term Care Resources.

Mahoney, F., and Barthel, D. (1965). "Functional evaluation: the Barthel Index." *Maryland State Medical Journal*, 14, 41-43.

Maly, R. C., Hirsh, S. H., and Reuben, D. B. (1997). "The performance of simple instruments in detecting geriatric conditions and selecting community-dwelling older people for geriatric assessment." *Age and Ageing*, 26, 223-231.

McDowell, I., and Newell, C. (1996). *Measuring Health. A guide to rating scales and questionnaires*, Oxford & University Press, New York.

McGinnis, G., Seward, M., Dejong, G., and Osberg, J. (1986). "Program evaluation of physical medicine and rehabilitation departments using self-report Barthel." *Archives of Physical Medicine and Rehabilitation*, 67, 123-125.

McGivney, S. A., Mulvihill, M., and Taylor, B. (1994). "Validating the GDS depression screen in the nursing home." *Journal of the American Geriatric Society*, 42, 490-492.

Molloy, D. W., 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*, 148, 102-105.

Molloy, D. W., McIlroy, W. E., Guyatt, G. H., and Lever, J. A. (1991). "Validity and reliability of the Dysfunctional Behaviour Rating Instrument." *Acta Psychiatrica Scandinavica*, 84, 103-106.

Moore, A. A., and Siu, A. L. (1996). "Screening for common problems in ambulatory elderly: clinical confirmation of a screening instrument." *The American Journal of Medicine*, 100, 438-443.

Neal, L. (1998). "Current functional assessment tool...Barthel Index, the Functional Independence Measure (FIM), and PULSES." *Home Healthcare Nurse*, 16(11), 766-72.

Norris, J. T., Gallagher, D., Wilson, A., et al. (1987). "Assessment of depression in geriatric medical outpatients: the validity of two screening measures." *Journal of the American Geriatric Society*, 35, 989-995.

Nouri, F., and Lincoln, N. (1987). "An extended activities of daily living scale for stroke patients." *Clin Rehabil*, 1, 301 - 305.

Oliver, J. M., and Simmons, M. E. (1984). "Depression as measured by the DSM-III and the Beck Depression Inventory in an unselected adult population." *Journal of Consulting and Clinical Psychology*, 52, 892-898.

Pfeffer, R. I. (1982). "Measurement of functional activities in older adults in the community." *Journal of Gerontology*, 37, 323-329.

Pfeiffer, E. (1975). "A Short Portable Mental Status Questionnaire for the assessment of organic brain deficit in elderly patients." *Journal of American Geriatric Society*, 23, 433-441.

Philp, I. (1997). "Can a medical and social assessment be combined?" *Journal of the Royal Society of Medicine*, 90(Suppl 32), 11-13.

Poulos, R. (1999). "An analytic review of community service utilisation among frail and disabled older people," Unpublished thesis, Macquarie University, Sydney.

Robertson, D., Rockwood, K., and Stolee, P. (1982). "A short mental status questionnaire." *Canadian Journal of Aging*, 1, 16-20.

Roy, C., Togneri, J., Hay, E., and Pentland, B. (1988). "An inter-rater reliability study of the Barthel Index." *International Journal of Rehabilitation Research*, 11, 67-70.

Royal College of Physicians of London, and The British Geriatrics Society. (1992). *Standardised assessment scales for elderly people. A report of joint workshops of the Research Unit of the Royal college of Physicians and the British Geriatrics Society*, Royal College of Physicians of London, London.

Rule, B. G., Harvey, H. Z., and Dobbs, A. R. (1989). "Reliability of the Geriatric Depression Scale for younger adults." *Clinical Gerontology*, 4, 21-28.

Ryden, M. D. (1988). "Aggressive behaviour in persons with dementia who live in the community." *Alzheimer Disease and Associated Disorders*, 2, 342-355.

Schoening, H., Anderegg, L., Berstrom, D., et al. (1965). "Numerical scoring of self-care status of patients." *Arch Phys Med Rehabil*, 46, 689-697.

Schoening, H., and Iverson, I. (1968). "Numerical scoring of self-care status: a study of the Kenny self-care evaluation." *Archives of Physical Medicine and Rehabilitation*, 49, 221-229.

Schuling, J., de Haan, R., Limburg, M., and Groenier, K. (1993). "The Frenchay Activities Index. Assessment of Functional Status in Stroke Patients." *Stroke*, 24(8), 1173-1177.

Sheikh, k., Smith, D., Meade, T., Goldenberg, E., Brennan, P., and Kinsella, G. (1979). "Repeatability and validity of a modified activities of daily living (ADL) index in studies of chronic disability." *International Rehabilitation Medicine*, 1, 51-8.

- Sheikh, J. I., and Yesavage, J. A. (1986). "Geriatric Depression Scale (GDS): recent evidence and development of a shorter version." *Clinical Gerontology*, 5, 165-172.
- Shinar, D., Gross, C., Bronstein, K., et al. (1987). "Reliability of Activities of daily living and its use in telephone interview." *Arch Phys Med Rehabil*, 68, 723 - 728.
- Smith, D., Goldenberg, E., and Ashburn, A. (1981). "Remedial therapy after stroke: a randomised, controlled trial." *British Medical Journal*, 282, 517-520.
- Spector, W., Katz, S., Murphy, J., and Fulton, J. (1987). "The hierarchical relationship between activities of daily living and instrumental activities of daily living." *Journal of Chronic Diseases*, 40(6), 481-489.
- Stewart, A. L., and Ware, J. E. (1992). *Measuring functioning and well-being: the Medical Outcomes Study Approach*, Duke University Press, Durham, North Carolina.
- Streiner, D. L., and Norman, G. R. (1996). *Health Measurement Scales. A practical Guide to their development and use*, Oxford medical publications, Oxford.
- Stuck, A. E., Walthert, J. M., Nikolaus, T., Bula, C. J., Hohmann, C., and Beck, J. C. (1999). "Risk factors for functional status decline in community-living elderly people: a systematic literature review." *Social Science and Medicine*, 48, 445-469.
- Suurmeijer, T. P. B. M., Doeglas, D. M., Moum, T., Briancon, S., Krol, B., Sanderman, R., Guillemin, F., Bjelle, A., and Van Den Heuvel, W. J. A. (1994). "The Groningen Activity Restriction Scale for measuring disability: its utility in international comparisons." *American Journal of Public Health*, 84(8), 1270-1273.
- Sutherland, T., Hill, J. L., Mellow, A. M., et al. (1989). "Clock drawing in Alzheimer's disease: a novel measure of dementia severity." *Journal of American Geriatric Society*, 37, 725-29.
- Teng, E. L., and Chui, H. C. (1987). "The modified Mini-Mental State (3MS) Examination." *Journal of Clinical Psychiatry*, 48, 314-318.
- Tinetti, M. E., Baker, D. I., McAvay, G., Claus, E. B., Garrett, P., Gottschalk, M., Koch, M. L., Trainor, K., and Horwitz, R. I. (1994). "A multifactorial intervention to reduce the risk of falling among elderly people living in the community." *New England Journal of Medicine*, 331(13), 821-827.
- Thal, L. J., Grundman, M., and Golden, R. (1986). "Alzheimer's disease: a correlation analysis of the Blessed Information-Memory-Concentration test and the Mini-Mental State Exam." *Neurology*, 36, 262-264.
- Thomas, V. S., Rockwood, K., and McDowell, I. (1998). "Multidimensionality in Instrumental and Basic Activities of Daily Living." *Journal of Clinical Epidemiology*, 51(4), 315-321.
- Towle, D. (1988). "Use of 'extended activities of daily living scale' with depressed stroke patients." *International Disability Studies*, 10(4), 148-149.
- Tuokko, H., Hadjistavropoulos, T., Miller, J. A., et al. (1992). "The clock test: a sensitive measure to differentiate normal elderly from those with Alzheimer's disease." *Journal of American Geriatric Society*, 40, 579-84.
- Uhlmann, R. F., and Larson, E. B. (1991). "Effect of education on the Mini-Mental State Examination as a screening test for dementia." *Journal of the American Geriatric Society*, 39, 876-880.
- Wade, D., and Hewer, R. (1987). "Functional abilities after stroke: measurement, natural history and prognosis." *Journal of Neurol Neurosurg Psychiatry*, 50, 177-182.
- Wade, D., and Collin, C. (1988). "The Barthel Index: a standard measure of physical disability?" *International disability studies*, 10, 64-67.
- Wade, D. (1992). *Measurement in Neurological Rehabilitation*, Oxford University Press, Oxford.
- Watson, Y. I., Arfken, C. L., and Birge, S. J. (1993). "Clock completion: an objective screening test for dementia." *Journal of American Geriatric Society*, 41, 1235-40.
- Whiting, S., and Lincoln, N. (1980). "An ADL assessment for stroke patients." *British journal of Occupational Therapy*, 43, 44-46.
- Wilkinson, P., Wolf, C., Warburton, F., et al. (1997). "Longer term quality of life and outcome in stroke patients: is the Barthel Index alone an adequate measure of outcome." *Quality in Health Care*, 6(3), 125-130.
- Wood-Dauphinee, S., Berg, K., and Daley, K. (1994). "Monitoring status and evaluating outcomes: An overview of rating scales for use with patients who have sustained a stroke." *Topics in Geriatric Rehabilitation*, 10(2), 22-41.
- Yesavage, J. A., Brink, T. L., Rose, T. L., et al. (1983). "Development and validation of a geriatric depression screening scale: a preliminary report." *Journal of Psychiatric Research*, 17, 37-49.
- Yohannes, A., Roomi, J., Waters, K., and Connolly, M. (1998). "A comparison of the Barthel Index and Nottingham extended activities of daily living scale in the assessment of disability in chronic airflow limitation in old age." *Age & Ageing*, 27(3), 369-74.