Measures for Basic and Instrumental Activities of Daily Living (ADLs)

Basic and instrumental activities of daily living (ADLs) are tasks that one must perform to function in their everyday lives. Basic ADLs are core tasks such as eating, grooming, dressing and bathing. Instrumental ADLs are higher-level and more complicated tasks such as managing medications and finances, and preparing meals. Both basic and instrumental ADLs are affected by dementia – as dementia progresses (worsening cognitive impairment), the ability to perform these ADLs deteriorates too, with IADLs being the first to decline. Hence, assessing the level of functioning in ADLs can help to determine the severity/stage of dementia.

In Dementia Singapore and across most care settings in Singapore (such as home care, centre-based services and long-term care), Shah Modified Barthel Index[1] (MBI) is the instrument most commonly used to measure individuals' abilities in basic and instrumental ADLs (refer to the table below for more information on the Shah MBI).

Several validated tools measuring basic and instrumental ADLs that have been used on persons living with dementia across various care settings are listed in alphabetical order in the following table, which provides a brief amount of information of each tool and citation links to the tools. The usual practice involves having the first measurement taken at baseline, and subsequent ones taken again periodically (for example, every 6 months or whenever there is a change in a person's demeanor); these scores are then compared to understand the person's functional status, whether their abilities in basic and instrumental ADLs have been maintained or deteriorated.

Click the name of the tool and/or get access to the journal article of the original study for more details on the tools, such as their development, instructions on how to administer and score them, and interpretations of scores:

Tools Measuring Basic ADLs

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
Bristol Activities of Daily Living Scale[2] (BADLS) Click here to access the scale, and here for the journal article.	20	**Strengths:** ● Designed specifically for persons living with dementia, having been developed with consultation and assistance from carers of persons living with dementia.[3] ● Brief and easy to administer.[2] ● Can be self-completed by carers.[3] **Limitations:** ● BADLS is not sensitive to early, very small changes in ADLs.[3] ● Ceiling effect – Difficult to discriminate among scores that are at the top end of the scale.[3]	**Reliability:** ● The 22-items preliminary version had excellent test-retest reliability, *r* = .95.[2] **Validity:** ● Evidence of face validity – items were developed with carers; ● Evidence of construct validity – PCA showed 4 principal components with eigenvalue greater than or equal to 1, (1) IADLs, (2) Self-care, (3) Orientation and (4) Mobility; and ● Evidence of concurrent validity – Significant correlations between the tool, and Mini Mental State Examination[4] (MMSE) and the Observed task performance of the Observation Scale.[2]	Cite the developers to use the scale. No other permissions are required.

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
Katz Index of Independence in Activities of Daily Living[5] (Katz Index of ADL) Click here to access the scale, and here for the journal article.	6	**Strengths:** ● Sensitive to changes in declining health status.[5] **Limitations:** ● Not sensitive to small changes in basic ADLs.[5]	Although no formal reliability and validity have been reported, the tool has been used extensively in older adults in clinical and home environments.[5]	Permission is hereby granted to reproduce, post, download, and/or distribute, the material in its entirety only for not-for-profit educational purposes only, provided that The Hartford Institute for Geriatric Nursing, College of Nursing, New York University is cited as the source. Notify the usage of the material by emailing to: hartford.ign@nyu.edu

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
Shah MBI[1] Click here and refer to pages 37-40 of the document to access the scale, and here for the journal article.	10	**Strengths:** ● Most commonly used in Singapore. ● Widely used in clinical practice; ● Easy to use; ● Can be completed in a short period of time (10-15 minutes); ● More sensitive to small changes in ADLs, thus providing better discrimination of functional ability; and ● Developed from the original Barthel Index, which was once a gold-standard ADL assessment tool.[1] **Limitations:** ● Limited literature on the application of the tool on persons living with dementia or other neurocognitive disorders.	**Reliability:** Multiple studies have established that the tool has a good level of reliability across various populations and languages: ● Excellent content reliability and internal consistency, with Cronbach's alpha = .90 at the commencement, and Cronbach's alpha = .93 and .92 at discharge of rehabilitation.[1] ● Excellent internal inconsistency of the tool for stroke patients (Cronbach's alpha = .93) and spinal cord injury patients (Cronbach's alpha = .88); sufficient inter-rater reliability at the item level (Kappa levels of above .60 for stroke and above .50 for spinal cord injury); and good intra-class coefficients (.99 for stroke and .77 for spinal cord injury).[6] ● Chinese version of the MBI on stroke patients has comparable test-retest and inter-rater reliability with the original version, with Kappa statistic ranging from 0.63 to 1.00 across the 10 domains.[7] ● Korean version of the MBI also has excellent internal consistency, Cronbach's alpha = .92.[8]	Cite the developers to use the scale. No other permissions are required.

			Validity: ● A study reported evidence of validity: there are significant correlations between Shah MBI, the Original Barthel Index and 4 of the 6 subsections of the Functional Independence Measure, with *r* = .86 to .96.[9]	

Tools Measuring Instrumental ADLs

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
Lawton Instrumental Activities of Daily Living (IADL) Scale[10] Click here to access the scale, and here for the journal article.	8	**Strengths:** ● Easy to use; ● Can be administered in short amount of time (10-15 minutes); ● Results derived from the tool can assist care professionals in planning for safe discharge; and ● Widely used in research and in clinical practice.[11] **Limitations:** ● As it is a self-report tool, it may lead to an overestimation or underestimation of abilities; and ● Not sensitive to small changes in IADLs.[11]	**Reliability:** ● Original article reported good interrater reliability, *r* = .85; and ● Reproducibility coefficient (ability of a test to produce consistent results when repeated under the same conditions) was .96 for men and .93 for women.[10] **Validity:** ● Original article also reported significant correlations between the scale and the following 4 other functional status measures, ranging from .40 to .61:[10] ○ Self-care activities ○ Physical health ○ Mental health ○ Behavioural and social adjustment.	Permission has been granted to reproduce, post, download, and/or distribute, the material in its entirety only for not-for-profit educational purposes only, provided that The Hartford Institute for Geriatric Nursing, College of Nursing, New York University is cited as the source. Notify the usage of the material by emailing to: hartford.ign@nyu.edu

Tools Measuring Both Basic and Instrumental ADLs

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
Assessment of Motor and Process Skills[12-14] (AMPS) Click here for more information on the assessment.	36	**Strengths:** ● Able to differentiate among persons of varying functional level; [12] ● Person-centric: The person being assessed can choose the tasks that he/she wants to perform, which are meaningful and relevant to his/her everyday life; ● Requires no special equipment and can be administered in any relevant setting within 30 to 40 minutes; ● Has been standardised internationally and cross-culturally on more than 100,000 subjects; ● Provides Occupational Therapists (OTs) with elaborated information that is useful for planning and documentation of care goals and interventions, and tracking and measuring of the person's performance and outcomes; and ● Uses a measurement model: ○ Though people may perform different tasks, OTs are able to determine the functional abilities of these people while taking into account the different challenges of the varying tasks. Thus people who perform	● Multiple studies supported the reliability and validity of the AMPS across age groups[16], between gender[17], and with a variety of diagnoses (e.g., multiple sclerosis, Alzheimer's disease, stroke).[18-20] ● Multiple studies have also established AMPS's validity in relation to other instruments, such as the Scales of Independence Behaviour, the Older American Resources and Services, the Sickness Impact Profile, and the Functional Independence Measure.[21]	Raters are required to complete a 5-day training course and a calibration process (complete 10 AMPS assessments and submit for data analyses within 3 months) before they can use the tool and have access to the AMPS computer-scoring software. The AMPS manual and software can be purchased online at http://www.ampsintl.com/.

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
		different tasks can still be directly compared; and ○ To analyse a person's scores and generate ADL motor and process ability measures, which are adjusted to account for the severity of the rater who scored the person's performance. Hence a person's ADL ability measures are not biased by the rater.[15] **Limitations:** ● Raters are required to successfully complete a 5-day training course and a calibration process (complete 10 AMPS assessments and submit for data analyses within 3 months) before they can use the tool and have access to the computer scoring software.[15] ● The AMPS computer-scoring software is only available to persons who successfully complete the abovementioned training and calibration process.[15]		

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
Pool Activity Level (PAL) Checklist[22] Click here to download the checklist.	9	**Strengths:** ● Easy to complete; can be completed in a short duration; ● Available in several languages; ● Can be completed by non-professionals who have no clinical skills (not occupational therapy specific); ● Takes a person-centric approach and focuses on the strengths of an individual being assessed; ● Additional guide is provided for caregivers and professionals on how to modify the individual's physical and social environment to enable and sustain them at their level of ability; and ● Information collected is useful in care and activities planning.[22] **Limitations:** ● Subjected to the user's self-interpretation; and ● Some items may not be culturally sensitive (for e.g., the item on 'Eating').	A study has established adequate reliability and validity for the Checklist to be administered on older persons living with dementia.[23] **Reliability:** ● Excellent internal consistency, with Cronbach's α = .95. ● Acceptable inter-rater reliability: Kappa values ranged from 0.42 to 0.94. ● Acceptable test-retest reliability: Kappa values ranged from 0.55 to 1.00. **Validity:** ● Very good content validity: 97% of 90 respondents (comprising occupational therapists, activity providers and other professionals) said the instructions of the tool were clear, and 93% said the tool was easy to complete. At least 77% of the respondents ranked 7 items as 'very important' or 'essential'. ● Strong concurrent validity: Highly significant correlations between the PAL Checklist and: ○ MMSE: -0.75 ○ Barthel Index (BI): -0.71	Cite the developers to use the checklist. No other permissions are required.

Tool & Citation Link	No. of Items	Strengths & Limitations	Psychometric Properties	Permission to Use
			○ Clifton Assessment Procedures for Elderly – Behaviour Rating Scale (CAPE-BRS): 0.71 ○ Bristol Activities of Daily Living Scale (BADLS): 0.82 ○ Clinical Dementia Rating (CDR) Scale: 0.81 ● Strong construct validity: Inter-item correlations ranged from 0.53 to 0.81.	

Dementia Singapore

References

1. Shah, S., Vanclay, F., & Cooper, B. (1989). Improving the sensitivity of the Barthel index for stroke rehabilitation. *Journal of Clinical Epidemiology, 42*(8), 703-709. doi: 10.1016/0895-4356(89)90065-6.

2. Bucks, R. S., Ashworth, D. L., Wilcock, G. K., & Siegfried, K. (1996). Assessment of activities of daily living in dementia: Development of the Bristol activities of daily living scale. *Age and Ageing, 25*(2), 113-120. https://doi.org/10.1093/ageing/25.2.113

3. Bucks, R. S., & Haworth, J. (2002). Bristol activities of daily living scale: A critical evaluation. *Expert Review of Neurotherapeutics, 2*(5), 669-676. https://doi.org/10.1586/14737175.2.5.669

4. Folstein, M., Folstein, S., & McHugh, P. (1975). Minimental state: A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*, 189-198. doi:10.1016/0022-3956(75)90026-6.

5. Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of illness in the aged: The index of ADL: A standardized measure of biological and psychosocial function. *The Journal of the American Medical Association, 185*(12), 914-919. doi: 10.1001/jama.1963.03060120024016.

6. Wallace, M., & Shelkey, M. (2007). Katz index of independence in activities of daily living (ADL). *Urologic Nursing, 27*(1), 93-94.

7. Küçükdeveci, A. A., Yavuzer, G., Tennant, A., Süldür, N., Sonel, B., & Arasil, T. (2000). Adaptation of the modified Barthel Index for use in physical medicine and rehabilitation in Turkey. *Scandinavian Journal of Rehabilitation Medicine, 32*(2), 87-92. doi: 10.1080/003655000750045604

8. Leung, S. O. C., Chan, C. C. H., & Shah, S. (2007). Development of a Chinese version of the modified Barthel index: Validity and reliability. *Clinical Rehabilitation, 21*(10), 912-922. doi: 10.1177/0269215507077286.

9. Hong, I., Lim, Y., Han, H., Hay, C. C., & Woo, H. (2017). Application of the Korean Version of the modified Barthel index: Development of a keyform for use in clinical practice. *Hong Kong Journal of Occupational Therapy, 29*(1), 39-46. https://doi.org/10.1016/j.hkjot.2017.06.001

10. Fricke, J., & Unsworth, C. A. (2010). Inter-rater reliability of the original and modified Barthel index, and a comparison with the functional independence measure. *Australian Occupational Therapy Journal, 44*(1), 22-29. doi:10.1111/j.1440-1630.1997.tb00750.x

11. Lawton, M. P., & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *The Gerontologist,* 9(3), 179-186. https://doi.org/10.1093/geront/9.3_Part_1.179

12. Graf, C. (2008). The Lawton instrumental activities of daily living scale. *The American Journal of Nursing, 108*(4), 52-62. doi: 10.1097/01.NAJ.0000314810.46029.74

13. Fisher, A. G. (1995). *Assessment of motor and process skills (first edition).* Three Star Press, Inc.

14. Fisher, A. G. (1997). *Assessment of motor and process skills (second edition).* Three Star Press, Inc.

15. Fisher, A. G. (2003). *Assessment of motor and process skills (sixth edition), volume 1: Development, standardization, and administration manual*. Three Star Press, Inc.

16. Fisher, A. G. & Jones, K. B. (2010). *Assessment of motor and process skills volume 1: Development, standardization, and administration manual (seventh edition, revised)*. Three Star Press, Inc.

17. Hayase, D., Mosenteen, D. A., Thimmaiah, D., Zemke, S., Atler, K., & Fisher, A. G. (2004). Age-related changes in activities of daily living (ADL) ability. *Australian Occupational Therapy Journal, 51*(4), 192-198. https://doi.org/10.1111/j.1440-1630.2004.00425.x

18. Merritt, B. K., & Fisher, A. G. (2003). Gender differences in the performance of activities of daily living. *Archives of Physical Medicine and Rehabilitation, 84*, 1872-1877. https://doi.org/10.1016/S0003-9993(03)00483-0

19. Doble, S. E., Fisk, J. D., Fisher, A. G., Ritvo, P. G., & Murray, T. J. (1994). Functional competence of community dwelling persons with multiple sclerosis using the assessment of motor and process skills. *Archives of Physical Medicine and Rehabilitation, 75*(8), 843-851. doi: 10.1016/0003-9993(94)90107-4

20. Hartman, M. L., Fisher, A. G., & Duran, L. (1999). Assessment of functional ability of people with Alzheimer's disease. *Scandinavian Journal of Occupational Therapy, 6*(3), 111-118. https://doi.org/10.1080/110381299443690

21. Rexroth, P., Fisher, A. G., Merritt, B. K., & Gliner, J. (2005). Ability differences in persons with unilateral hemispheric stroke. *Canadian Journal of Occupational Therapy, 72*(4), 212-221. https://doi.org/10.1177/000841740507200403

22. Marom, B., Jarus, T., & Josman, N. (2006). The relationship between the assessment of motor and process skills (AMPS) and the large allen cognitive level (LACL) test in clients with stroke. *Physical & Occupational Therapy In Geriatrics, 24*(4), 33-50. https://doi.org/10.1080/J148v24n04_03

23. Pool, J. (2014). *The Pool Activity Level (PAL) instrument for occupational profiling: A practical resource for carers of people with cognitive impairment* (4th ed.). London: Jessica Kingsley.

24. Wenborn, J., Challis, D., Pool, J., Burgess, J., Elliott, N., & Orrell, M. (2008). Assessing the validity and reliability of the Pool Activity Level (PAL) Checklist for use with older people with dementia. *Aging & Mental Health, 12*(2), 202–211. doi:10.1080/136078608019