

JIDR

Supporting Advanced Dementia in people with Down syndrome and other intellectual disabilities:
Consensus Statement of the International Summit on Intellectual Disability and Dementia
Mary McCarron¹, Philip McCallion², Karen Watchman³, Matthew P. Janicki⁴, Antonia Coppus⁵, Kathy Service⁶, Juan Fortea⁷, Mary Hogan⁸, Evelyn Reilly⁹, Sandy Stemp¹⁰

Abstract

The International Summit on Intellectual Disability and Dementia (Glasgow, Scotland; October 2016) noted that advanced dementia can be categorised as that stage of dementia progression characterised by significant losses in cognitive and physical function, including a high probability of further deterioration and leading to death. The questions before the Summit were whether there were similarities and differences in expressions of advanced dementia between adults with intellectual disability and adults in the general population.

The Summit noted challenges in the staging of advanced dementia in people with ID with the criteria in measures designed to stage dementia in the general population heavily weighted on notable impairment in activities of daily living. For many people with an intellectual disability (ID) there is already dependence in these domains generally related to the individuals pre-existing level of intellectual impairment, i.e., totally unrelated to dementia. Hence, the summit agreed that as was true in achieving diagnosis, it is also imperative in determining advanced dementia that change is measured from the person's prior functioning in combination with clinical impressions of continuing and marked decline and of increasing co-morbidity, including particular attention to late onset epilepsy in people with Down syndrome. It was further noted that quality care planning must recognise the greater likelihood of physical symptoms, comorbidities, immobility and neuropathological deterioration.

The Summit recommended an investment in research to more clearly identify measures of person-specific additional decline for ascertaining advanced dementia, inform practice guidelines to aid clinicians and service providers, and to identify specific markers that signal such additional decline and progression into advanced dementia among people with various levels of pre-existing intellectual impairment.

Introduction

As part of an invitational meeting (the International Summit on Intellectual Disability and Dementia held in Glasgow, Scotland, on October 13-14, 2016) attendees examined various dementia-related issues affecting people with intellectual disability and particularly those presenting with advanced dementia. Given that criteria defined dementia is at times 2-5 times more common among some persons with an intellectual disability, with a shift in risk to younger age groups compared to the general population (Strydom, Hassiotis, King, & Livingston, 2009), this topic was given special consideration.

Specifically, there was consideration of the characteristics of advanced dementia in adults with intellectual disability and of the similarities and differences in expressions of advanced dementia in adults in the general population and what differences were notable between adults subject to early-onset dementia (such as those with Down syndrome) and other aetiologies of intellectual disability. One challenge was to define what might be considered advanced dementia in adults with Down syndrome or other intellectual disability and to examine the utility and/or usefulness of tools developed to identify stages of dementia in the general population. These considerations added to the Summit's outcomes, which resulted in a series of consensus statements and reports, including this statement on advanced dementia.

Background

Adults with intellectual disability are as susceptible to Alzheimer's disease (AD) and other causes of dementia generally at the same rates as persons in the general population; however, adults with Down syndrome are at greater risk (Strydom et al., 2010), with many such adults showing symptoms of early onset in their late 40s or early 50s (Coppus et al., 2006; Holland, Hon, Huppert & Stevens, 2000; McCarron, McCallion, Reilly, & Mulryan, 2014). People with ID who do not have a diagnosis of Down syndrome or people with ID from other aetiologies generally show onset symptoms at an age mirroring the general population. It is well established that diagnosing dementia in people with intellectual disability is more complex than in the general population due to varying levels of pre-existing intellectual impairment, communication difficulties, and frequent staff turn-over with a loss of informants with knowledge of the individual's level of functioning, particularly in basic and instrumental activities of daily living.

One additional factor complicating identifying advanced dementia in people with Down syndrome and other intellectual disability is the variations in innate cognitive functions, and confusion over whether these deficits are a reflection of intellectual disability or of the progression of dementia.

Advanced dementia: Dementia in an advanced stage is usually characterised as when progression proceeds to where significant losses in function are evident and where there is a high probability of further deterioration, leading to death (Alzheimer's Australia, n.d.; Alzheimer's Society, 2017). In most staging schemes, this latter stage generally signals extensive personal care by carers and can last up to 2.5 years (Reisberg, Ferris, deLeon, & Crook, 1982; DeLeon & Reisberg, 1999). In the general population, the clinical features of advanced stage dementia have been previously described as: 'profound memory deficits (e.g., inability to recognise family), minimal verbal communication, loss of ambulatory abilities, the inability to perform activities of daily living, and urinary and faecal incontinence. The most common clinical complications are eating problems and infections, and these require management decisions" (p. 2534; Mitchell, 2015). The clinical features of advanced dementia in people with Down syndrome and other intellectual disability, (as noted in Table 1) are similar to those described by Mitchell (2015). One important exception is that among adults with Down syndrome, rates of late onset seizures may range up to 70-80% (Crespel, Gonzalez, Coubes, & Gelisse, 2007; Menendez, 2005; McCarron et al., 2014).

Determination of advanced dementia: The identification of the presence of dementia can be confounded by lack of knowledge among many health and social care professionals on the clinical presentation of dementia in people with intellectual disability and the applicability of commonly used standardised test instruments. At the most basic level of screening and establishing symptoms of dementia, instruments used in the general population, such as the Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975), and assessment scales such as the Clinical Dementia Rating Scale (Morris, 1993) and the Alzheimer's Disease Assessment Scale – Cognitive section (ADAS-Cog; Rosen et al., 2004) are inappropriate for people with pre-existing cognitive impairment, as most people with even mild intellectual disability are likely to meet screening cut off criteria for these instruments. Thus, most clinicians tend to turn to specialised instruments applicable to persons with Down syndrome and other

intellectual disability. A number of sources have identified the utility of a number of these specialty instruments (see Alyward, Burt, Thorpe, Lai, & Dalton, 1997; British Psychological Society, 2015; Jokenin et al., 2013).

Increasingly, it is recognised that diagnosing dementia in people with Down syndrome and other intellectual disability is predicated on having an understanding of decline /change from the individual's previous level of functioning (see for example Strydom & Hassiotis, 2003). To increase diagnostic accuracy, it is important to have a reliable baseline measure of functioning and a key informant who has known the individual over an extended period of time.

Unfortunately, baseline measurement of functioning is more often an exception rather than the norm, with frequent staff changes in out-of-home placements and lack of regular assessment in family situations often meaning that there is poor knowledge, understanding, or measurement of decline/change. This often results in the individual progressing to a more advanced stage of dementia before any diagnosis is made, further confounding difficulties in the staging of dementia. Moreover, dementia may present differentially within various syndromes or aetiologies of intellectual disability. For all of these reasons, the ability to ascertain advanced dementia will be improved if there is earlier and more comprehensive attention to the development of baseline functioning and the pursuit of earlier diagnosis so that there is a new time of diagnosis baseline established against which progression to advanced dementia can be measured and ascertained. The same measures now being more widely used and recommended in the diagnosis of dementia in people with Down syndrome and other intellectual disabilities are likely to be the most sensitive to measuring such changes. However, clinical impressions and information from informants will also be important.

Standard neuroimaging such as CT/MRI scanning generally used to support diagnosis in the general population is less helpful in people with intellectual disability. The most consistent structural change of early Alzheimer's dementia in the general population is atrophy of the medial temporal lobe, but among people with Down syndrome, for example, medial temporal lobe atrophy occurs at an earlier age and is totally unrelated to dementia. Due to lack of standardisation in other syndromes, neuroimaging is of limited value to the diagnosis of dementia in people with intellectual disability (British Psychological Society, 2015). All of these issues add additional complexity in diagnosing and staging of dementia in people with

intellectual disability and make it difficult to recognise the transition across stages, including when the person has progressed to a more advanced stage.

There is even greater diagnostic uncertainty in older age as many adults with intellectual disability, especially those with Down syndrome, are also at increased risk of other health conditions which often mimic dementia and/or confound diagnosis such as hypothyroidism, sensory impairments, B12 and folate deficiency, and depression (Prasher, 2005). The presence of these conditions may further complicate staging diagnosis. As well as increased risk of earlier age of onset, syndromes associated with precocious ageing (e.g., Cockayne, Sanfillipo, and Williams syndromes) may mean a precipitous decline and shorter dementia duration (Janicki, Henderson, Rubin, & the Neurodevelopmental Conditions Study Group, 2008), although the literature on the prevalence of dementia in these ‘orphan’ syndromes is sparse. Precipitous decline and shorter duration of dementia adds to the difficulty in staging. There are similar challenges with persons with intellectual disability who also have been diagnosed with head trauma or brain injury (Nagdee, 2010).

The Summit, after a review of related anecdotal and clinical information, as well as research data, supports characterising late or advanced stage dementia into its neurocognitive, functional, nutritional, and comorbid health condition aspects. Data from a number of studies, including an Irish cohort of 77 women with Down syndrome followed over 20 years from pre-diagnosis to diagnosis to end stage disease (McCarron et al 2014; McCarron et al., under review) and from other studies, for example Coppus and colleagues (2008), have confirmed the value of this approach to establishing advanced dementia.

The Summit noted increased interest in staging in light of the progressive nature of dementia and the need to tailor care, environments, work and day programming to changing needs (Jokinen et al., 2013; McCarron, Gill, Lawlor, & Begley, 2002; McCarron & Griffiths, 2003; NTG, 2012). However, staging in the general population is based upon measurement of notable impairment of daily activities. For many people with intellectual disability there is dependence in basic ADLs (activities of daily living) mostly due to the pre-existing intellectual disability and therefore decisions to change care due to advanced dementia must be informed by

a more robust assessment of decline into advanced dementia. As is true for any assessment for people with Down syndrome and other intellectual disability, it is important to focus on changes from the person's prior functioning and/or in new symptoms as compared to prior health status. For advanced dementia these changes are from the functioning and the staging established at time of diagnosis. Again, decline and staging of dementia in this population appears best achieved by annual assessments (from the age of 40 in Down syndrome and from the age of 50 in people with other ID) using scales recommended for persons with Down syndrome and other intellectual disabilities (Alyward et al., 1997; Zellinger et al., 2013).

The Summit participants agreed that reliance upon information from informants as well as objective measures is always an issue in dementia diagnosis (Cordell et al., 2013), but is particularly of concern for people with DS and other intellectual disabilities who frequently have communication difficulties. The sensitivity of assessment instruments seeking information on changes to baseline functioning are also challenged by the subtleness of change (Mulryan et al, 2009). There is a growing history on the use of such instruments in people with Down syndrome and to some extent with other intellectual disabilities and insights have emerged on the strengths and weaknesses of available measures (for a review see Strydom & Hassiotis, 2003; Jokinen et al., 2013; Zellinger, et al., 2013). There is a need for a similar attention to instrumentation for the identifying progression into the later stages of dementia. One attempt to operationalise identifying possible progression to an end-of-life state in advanced dementia can be found in McCallion et al., (2017).

Ascertaining Advanced Dementia

For the general population, there are recommended instruments for ascertaining the transition to advanced dementia (Sheehan, 2012), such as the Global Deterioration Scale (GDS; Reisberg et al., 1982) and the Functional Assessment Staging Tool (FAST; see stage 7; Reisberg, 1988). These instruments combine clinical impressions with data on growing inability of the person to dress, prepare meals, eat and drink independently, walk without assistance, attend to personal hygiene, maintain continence of urine and stool, and speak or meaningfully communicate. Clinical impressions are also called for in assessing people with Down syndrome

and other intellectual disabilities but activities of daily living items have little utility in assessing advanced dementia in people with Down syndrome and other intellectual disabilities, as many already have such challenges and deficits unrelated to dementia, and instead characteristic of their pre-existing level of intellectual impairment.

The combination of existing life-long cognitive impairments among people with intellectual disability, along with compromises due to dementia, frequently mean that what would otherwise be considered relatively small changes in functioning in the general population could become major changes for a person with with Down syndrome and other intellectual disabilities, depending on their level of functioning.

Therefore, all of these factors have implications for the staging of dementia in people with Down syndrome and other intellectual disabilities using instruments such as the Global Deterioration Scale (GDS) and the Functional Assessment Staging Test (FAST) validated for use in the general population. The pre-existing difficulties apparent in many people with with Down syndrome and other intellectual disabilities in relation to communication, mobility, and ADLs may mean these instruments may prematurely categorise those adults with intellectual disability as being at an advanced stage of dementia. By way of illustration, data from one major study (McCarron et al., 2011), showed that 92.2% of adults with severe/profound intellectual disability with no dementia diagnosis had difficulty in making themselves understood when speaking, 78% required assistance with eating, and 80% required assistance with dressing, items that would cause them to be scored with advanced dementia in dementia staging scales (they would score as stage 6 of the FAST tool) used in the general population. The use of standard ADL/IADL instruments if compared to the person's own prior level of functioning as opposed to scale norms may still be useful in assessing people with with Down syndrome and other intellectual disabilities, even if the resulting rates of change are small (Strydom & Hassiotis, 2003).

The Summit believes that it may be premature to determine if the existing general population instruments are of value or if new instruments or criteria need to be established for people with Down syndrome and other intellectual disabilities. Instead, it may be of more value to develop better understandings of the presentation of stages of dementia, particularly advanced dementia, in people with with Down syndrome and other intellectual disabilities, in order to inform decisions about the best measures to be used. The literature is more developed for those

with Down syndrome and some unique issues for this group such as early onset and a clearer relationship with epilepsy are already emerging. Nevertheless, the Summit participants also believed that more research is needed in defining behaviour and function in adults with intellectual disability in the later stages of dementia, and determining whether differences in expression do in fact exist among syndromes and whether, as a group, adults with Down syndrome differ significantly in latter stage expression from other adults with intellectual disability from other aetiologies.

The Summit further supports that any use of general population instruments for staging dementia be informed by (1) a comparison with the person's prior level of functioning at time of diagnosis, (2) a recognition that small changes in functioning are significant changes for people with intellectual disability, and that (3) there is a need to utilise key informant information to monitor for symptoms of ill-health that may be signs of increased co-morbidity and frailty that co-exist with advanced dementia, (4) it is important to maintain particular vigilance to identify such subtle changes, and (5) among adults with Down syndrome, special attention should be paid to the development of new late-onset seizures.

Developing Responsive Quality Services

The Summit agrees that in advanced dementia the changes in functioning and the needs for support often call for a shift in the focus of care management, to increased attention to personal care and resourcing of skilled nursing and medical support. Care planning and resourcing must recognise the greater likelihood of:

- pain, chronic constipation, sensory impairments, oral and pharyngeal dysphasia with major challenges with eating, drinking and difficulties with swallowing.
- recurrent chest and urinary tract infections, initially difficult to recognise and which, leading to treatable acute and re-occurring episodes of delirium, may instead be misinterpreted as dementia advancing.
- skin integrity and complications of immobility concerns.
- management needs for seizures and other co-morbid health conditions such as hypothyroidism, arthritis and diabetes (McCarron et al 2017; Prasher, 2005, McCarron et al., 2002).

Consequently, the Summit contends that, more practically, particularly in advanced dementia, addressing the physical, emotional, psychological and spiritual care needs of the person is imperative. The dramatic and extensive changes in care needed further emphasise the need for more accurate establishment of when persons with Down syndrome and other intellectual disability are moving toward the advanced dementia stage. A systematic approach is also needed to support such assessments and the Summit acknowledges anecdotal support for using what has been called the **AFIRM** framework (see Figure 1) (Irish Hospice Foundation, 2015).

Insert Figure 1 About Here

The Summit agreed with and supports various consensus reports (e.g., WHO 2002, 2016; McCarron, 2009; Mitchell et al., 2009) that guided by understandings of futile and comfort care, and person-centred, relationship-centred and palliative principles, care strategies that support effective and compassionate decision-making for persons with intellectual disability and advanced dementia should include:

- Determining what is in the ‘best interest’ of the person in light of the terminal nature of dementia.
- Establishing the intent of treatment and the potential for beneficial outcomes vs. burden.
- Recognising that care decisions are best determined by care teams when they reflect the person’s wishes, and family/friend input.
- Pursuing care management using a five-step process: 1) clarify the clinical situation, 2) establish primary goals of care, 3) present the treatment options and their risks and benefits, 4) weigh the options against values and preferences, and 5) provide additional and on-going support.

Commentary

The Summit noted concerns related to identifying transition to an advanced stage of dementia for persons with Down syndrome and other intellectual disabilities. The Summit

concluded that the advanced dementia stage is also an emotional and value laden time complicated by relationship bonds (staff as well as family) and conflicts, and limited ability to know and understand the wishes of the person. Understanding that the person has arrived at or is approaching the advanced stage of dementia is important in determining and modifying recommended approaches to care. Having discussions about advanced dementia care is not a simple undertaking and it requires all staff/family supporting the person to be able to acknowledge and understand the person's level of understanding, their life history, their ability and involvement in life decisions prior to dementia and to agree on the stage of dementia arrived at (see McCallion et al., 2017).

Advanced dementia may signal the last stage of neurodegeneration associated with dementia, but for adults with Down syndrome as well for those with other intellectual disabilities there remains imprecision in measurement. Further, as measurement improves there must also be the capacity to offer responsive care practices which aim to improve the quality of life and death for the person through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual (WHO, 2016). Such considerations also led the Summit participants to make the following recommendations:

1. Continue attention to systematic baseline screening, assessment and follow up of people with Down syndrome and other intellectual disabilities using agreed standardised instruments
2. Compare the trajectory of dementia in people with Down syndrome to trajectories in people with intellectual disability from other aetiologies
3. Undertake research to develop more valid and reliable instruments for assessing advanced dementia-related cognitive and physical deterioration among adults with Down syndrome and people with intellectual disability.
4. Develop practice guidelines and widespread related training and education to support quality care when adults with an intellectual disability have advanced dementia.

5. Identify additional markers and prognostication models that may help signal decline and progression into advanced dementia among people with various levels of pre-existing intellectual impairment

References

- Alzheimer's Australia (n.d.) *The later stages of dementia*. Accessed from: <https://www.fightdementia.org.au/about-dementia/carers/late-stages-of-dementia>
- Alzheimer's Society (2017). *The later stages of dementia*. Accessed from: https://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=101
- Aylward, E.H., Burt, B.D., Thorpe, L.U., Lai, F., & Dalton, A.J. (1997). Diagnosis of dementia in individuals with intellectual disability. *Journal of Intellectual Disability Research*, 41(2), 152-164.
- British Psychological Society. (2015). *Dementia and people with intellectual disabilities guidance on the assessment, diagnosis, interventions and support of people with intellectual disabilities who develop dementia*. Leicester, UK: British Psychological Society.
- Coppus, A. W., Evenhuis, H. M., Verberne, G., Visser, F. E., Oostra, B. A., Eikelenboom, P., & ... van Duijn, C. M. (2008). Survival in elderly persons with Down syndrome. *Journal of The American Geriatrics Society*, 56(12), 2311-2316.
- Coppus, A., Evenhuis, H., Verberne, G., Visser, F., van Gool, P., Eikelenboom, P., & van Duijn, C. (2006). Dementia and mortality in persons with Down's syndrome. *Journal of Intellectual Disability Research*, 50(10), 768-777.
- Cordell, C.B., Borson, S., Boustani, M., Chodosh, J., Reuben, D., Verghese, J., Thies, W., Fried, L.B., Medicare Detection of Cognitive Impairment Workgroup (2013). Alzheimer's Association Recommendations for Operationalizing the Detection of Cognitive Impairment During the Medicare Annual Wellness Visit in a Primary Care Setting. *Alzheimers and Dementia*, 9(2), 141-150.
- Crespel, A., Gonzalez, V., Coubes, P., & Gelisse, P. (2007). Senile myoclonic epilepsy of Genton: Two cases in Down syndrome with dementia and late onset epilepsy. *Epilepsy Research*, 77, 165-168.
- de Leon, M.J., & Reisberg, B. (1999). *An atlas of Alzheimer's disease. The encyclopaedia of visual medicine series*. Carnforth, UK: Parthenon Publishing.
- Cosgrave, M.P., Tyrell, J., McCarron, M., Gill, M., & Lawlor, B.A. (2000). Irish Journal of Psychological Medicine, 17(1), 5-111.
- Folstein, M.F., Folstein, S.E., & 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(3), 189-198.

Holland, A.J., Hon, H., Huppert, F.A., & Stevens, F. (2000). Incidence and course of dementia in people with Down's syndrome: findings from a population-based study. *Journal of Intellectual Disability Research*, 44(2), 138-146.

The Irish Hospice Foundation (2015). *Guidance Document 1: Facilitating discussions on future and end-of-life care with a person with dementia*. Dublin: The Irish Hospice Foundation.

Janicki, M.P., Henderson, C.M., Rubin, I.L., & the Neurodevelopmental Conditions Study Group (2008). Neurodevelopmental conditions and aging: Report on the Atlanta Study Group Charrette on Neurodevelopmental Conditions and Aging. *Disability and Health Journal*, 1, 116-124.

Jokinen, J. Janicki, M.P., Keller, S.M., McCallion, P., Force, L.T., & the National Task Group on Intellectual Disabilities and Dementia Practices (2013). Guidelines for structuring community care and supports for people with intellectual disabilities affected by dementia. *Journal of Policy and Practice in Intellectual Disabilities*, 10(1), 1-28.

McCallion, P., Hogan, M., Santos, F.H., McCarron, M., Service, K., Stemp, S., Keller, S., Fortea, J., Bishop, K., Watchman, K., & Janicki, M.P. (2017). Consensus statement of the international summit on intellectual disability and dementia related to end-of-life care in advanced dementia. *Journal of Applied Research in Intellectual Disabilities*. 30(6), 1160-1164.

McCarron, M., & Griffiths, C. (2003). Nurses roles in supporting aging persons with intellectual disability and mental health problems: Challenges and opportunities for care. In P. Davidson, V. Prasher, & M.P. Janicki (Eds.). *Mental Health, Intellectual Disabilities and the Aging Process*. London: Blackwell.

McCarron, M. (2009). Dementia (in people with intellectual disability) In: Barr, O & Gates, B (Ed) *Oxford Handbook of Learning and Intellectual Disability Nursing*. (pp. 236-237). London: Oxford University Press.

McCarron, M., Swinburne, J., Burke, E., McGlinchey, E., Mulryan, N., Andrews, V., Foran, S., & McCallion P. (2011). *Growing older with an intellectual disability in Ireland in 2011: First results from the Intellectual Disability Supplement of the Irish Longitudinal Study on Ageing*. Dublin: Trinity College Dublin.

McCarron, M., Gill, M., Lawlor, B., & Begley, C (2002). Time spent caregiving for persons with the dual disability of Down syndrome and Alzheimer's dementia: Preliminary Findings. *Journal of Learning Disabilities*. 6(3), 263-276.

McCarron, M., McCallion, P., Fahey-McCarthy, E., Connaire, K., & Lane, J. (2010). Supporting persons with Down syndrome and advanced dementia: challenges & care concerns, *Dementia*, 9(2), 285-298.

McCarron, M., McCallion, P., Reilly, E., & Mulryan, N. (2014). A prospective 14 Year longitudinal follow-up of dementia in persons with Down syndrome. *Journal of Intellectual Disability Research*. 58(1), 61-70.

- McCarron, M., Gill, M., McCallion, P., & Begley, C. (2005). Alzheimer's dementia in persons with Down's syndrome, predicting time spent on day-to-day care-giving. *Dementia Journal of Intellectual Disability Research* 4(4), 521-538.
- McCarron, M., Reilly, E., Dunne, P., Mulryan, N., & McCallion, P. (2017). A prospective 20 Year Longitudinal Follow-up of Dementia in Persons with Down syndrome. *Journal of Intellectual Disability Research*, 61(9), 843-852.
- Menéndez, M. (2005). Down syndrome, Alzheimer's disease and seizures. *Brain Development*, 27(4), 246-252.
- Mitchell, S.L., Teno, J.M., Kiely, D.K., Shaffer, M.L., Jones, R.N., Prigerson, H.G., Volicer, L., Givens, J.L., & Hamel, M.B. (2009). The clinical course of advanced dementia. *New England Journal of Medicine*, 361, 1529-1538
- Mitchell, S.L., (2015). Advanced dementia. *New England Journal of Medicine*, 372, 2533-2540.
- Morris J.C. (1993). The Clinical Dementia Rating (CDR): current version and scoring rules. *Neurology*, 43(11), 2412–2414.
- Mulryan, N., Tyrrell, J., Cosgrave, M., Reilly, E., McCallion, P., & McCarron, M. (2009). The Test for Severe Impairment. In V.P. Prasher (Ed.). *Neuropsychological Assessments of Dementia in Down syndrome and Intellectual Disabilities*. (pp.129-142). NY: Springer.
- Nagdee, M. (2011). Dementia in intellectual disability: A review of diagnostic challenges. *African Journal of Psychiatry*, 14, 194-199.
- National Task Group on Intellectual Disabilities and Dementia Practice. (2012). 'My Thinker's Not Working': A national strategy for enabling adults with intellectual disabilities affected by dementia to remain in their community and receive quality supports. www.aadmd.org/ntg/thinker
- Prasher, V.P. (2005). *Alzheimer's disease and dementia in Down syndrome and intellectual disabilities*. Oxford, UK: Radcliffe Publishing.
- Reisberg, B. (1988). Functional assessment scale (FAST). *Psychopharmacological Bulletin*, 24(4), 653-659.
- Reisberg, B., Ferris, S. H., de Leon, M. J., & Crook, T. (1982). The Global Deterioration Scale for assessment of primary degenerative dementia. *The American Journal Of Psychiatry*, 139(9), 1136-1139.
- Rosen, H.J., Narvaez, J. M., Hallam, B., Kramer, J.H., Wyss-Coray, C., Gearhart, R., Johnson, J. K., & Miller, B.L. (2004). Neuropsychological and functional measures of severity in Alzheimer disease, frontotemporal dementia, and semantic dementia. *Alzheimer Disease & Associated Disorders*, 18(4), 202-207.
- Sheehan, B. (2012). Assessment scales in dementia. *Therapeutic Advances in Neurological Disorders*, 5, 349-358.

Strydom, A., & Hassiotis, A. (2003). Diagnostic instruments for dementia in older people with intellectual disability in clinical practice. *Aging and Mental Health*, 7(6), 431-437.

Strydom, A., Hassiotis, A., King, M., & Livingston, G. (2009). The relationship of dementia prevalence in older adults with intellectual disability (ID) to age and severity of ID. *Psychological Medicine*, 39(1), 13-21.

Strydom, A., Shooshtari, S., Lee, L., Raykar, V., Torr, J., Tsiouris, J., Jokinen, N., Courtenay, K., Bass, N., Sinnema, M., & Maaskant, M. (2010). Dementia in older adults with intellectual disabilities—epidemiology, presentation, and diagnosis. *Journal of Policy and Practice in Intellectual Disabilities*, 7(2), 96–110.

Visser, F. E., Aldenkamp, A. P., van Huffelen, A. C., & Kuilman, M. (1997). Prospective study of the prevalence of Alzheimer-type dementia in institutionalized individuals with Down syndrome. *American Journal on Mental Retardation* 101(4), 400–12.

World Health Organisation (2016). *WHO definition of palliative care*. Accessed from: <http://www.who.int/cancer/palliative/definition/en/>.

Zeilinger, E.L., Stiehl, K.A., & Weber, G. (2013). A systematic review on assessment instruments for dementia in persons with intellectual disabilities. *Research in Developmental Disabilities*. 34(11), 3962-77.

Figure 1: Characteristics of Advanced Dementia for Persons with Down Syndrome and other Intellectual Disabilities

| | |
|--|--|
| Neurocognitive | Progressive worsening memory Inability to verbally communicate Apathy - depression Confusion and disorientation (place, time, person) Delirium Unresponsiveness |
| Functional | Immobility with hypertonia Need for total assistance of ADLs Incontinence Frailty Weakness, fatigue |
| Nutritional | Loss of appetite Lack of ability to self-feed Swallowing difficulties Propensity to aspirate |
| Co-morbid health conditions | Seizures in Down syndrome Constipation and complications of immobility Respiratory difficulties and repeat pneumonia |
| Sources: McCarron et al 2014; Coppus et al., 2008; Cosgrave, 2000; McCarron et al., 2005, Prasher, 2005; Strydom et al., 2010; Visser, 1997. | |