**Title:** Addressing NDIS goals: Determining vision impairment severity

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**Abstract**

The National Disability Insurance Scheme (NDIS) has been heralded as “a new way of providing community linking and individualised support for people with permanent and significant disability, their families and carers” (NDIS, 2014). To date the scheme has had limited roll out across Australia, with several trial sites being launched. Individuals seeking support under the NDIS negotiate individualised support plans with planners from the National Disability Insurance Agency (NDIA). However there is growing concern over the cost of these plans, both short and long term, and a lack of alignment between the severity of the disability and the support planning. This has the potential for inequitable and unaffordable resource allocation.

This paper will report on a project between the NDIA and key stakeholders in vision impairment. The aim of the project has been to identify severity indicators of vision impairment, using the clinical results found in standard ophthalmology reports including visual acuity for near and distance and visual fields. These severity indicators are based on the World Health Organization International Classification of Disease, Version 10. The limitations of these severity indicators and an approach to include factors that better reflect the functional impact of vision impairment will be discussed.

**Introduction**

In 2010 the Australian Productivity Commission (APC) commenced an inquiry into national disability long-term care and support schemes. This enquiry was in response to a succession of reports for example, “The Way Forward” by the Disability Investment Group (2009), and “Shut Out” by the National People with Disabilities and Carer Council (2009). Both these reports identified inadequacies in current disability support and care, the impact on people with disabilities and their carers, and labelled the existing Australian disability support systems deeply flawed and failing to meet people’s needs (APC 2011, p. 93). The inquiry recommended a national approach to disability care and support, and subsequently the National Disability Insurance Scheme (NDIS) become a reality in 2012.

This paper will report on a collaborative project between the National Disability Insurance Agency (NDIA), the agency that provides support for people with disability through the NDIS, and the key Australian stakeholder organisations in vision impairment. This project developed a method for determining the severity of vision impairment from clinical results available in a standard ophthalmology or eye report, to be applied to reach decisions regarding appropriate NDIS disability support, for people with vision impairment. These methods also permitted the adjustment of the level of severity of vision impairment when factors exist that are known to further affect the person’s visual ability.

**Background to disability support in Australia**

Historically, Australia has attempted to recognise and support people with disability in an inclusive and enabling manner. These goals are reflected in such significant initiatives as the birth of the Australian Human Rights Commission in 1981, the Commonwealth Disability Services Act in 1986 and the Commonwealth Disability Discrimination Act in 1993; by signing the Convention on the Rights of Persons with Disabilities in 2006; by ratifying the United Nations Convention on the Rights of Persons with Disability in 2008; in 2009 by signing the National Disability Agreement, and in 2011 the endorsement of the National Disability Strategy to focus efforts “…towards achieving a society that is inclusive and enabling, providing equality and the opportunity for each person to fulfill their potential” (Council of Australian Governments 2011, p. 3).

Despite these initiatives, the grass root system of support for people with disability in Australia has been heavily censured for being “…underfunded, unfair, fragmented, and inefficient” (APC 2011, p. 2). In response to ongoing criticism and a subsequent review by the APC, the need for a new government funded national insurance scheme for Australians with disability, modelled on Medicare was identified. In 2012 the National Disability Insurance Scheme (NDIS) became a reality. The NDIS Act 2013 states the objectives of the NDIS include:

* To support the independence and social and economic participation of people with disability
* To provide reasonable and necessary supports
* To enable people with disability to exercise choice and control in pursuit of their goals and the planning and delivery of their supports
* To promote the provision of high quality and innovative supports that enable people with disability to maximise independent lifestyles and full inclusion in mainstream community (NDIS Act, 2013 p. 4)

**NDIS eligibility for people with vision impairment**

Under the new policy eligibility for disability support is determined by the independent statutory agency responsible for implementing the NDIS, known as The National Disability Insurance Agency (NDIA). A series of access requirements are applied that include age, residence, disability, and early intervention (NDIS Act, 2013). A person is considered to meet disability requirements if:

* The person has a disability that is attributable to one or more intellectual, cognitive, neurological, sensory or physical impairments or to one or more impairments attributable to a psychiatric condition, and
* The impairments/s are, or are likely to be permanent, and
* The impairment/s result in substantially reduced functional capacity to undertake, or psychosocial functioning in undertaking one or more of the following activities: communication, social interaction, learning, mobility, self-care, self-management, and
* The impairment/s affect the person’s capacity for social and economic participation and
* The person is likely to require support under the NDIS for the person’s lifetime. (NDIS Act 2013, p. 28).

It is also recognised that the impairment may vary in intensity when it is of a chronic and episodic nature.

Once NDIS eligibility has been confirmed, an individual plan is developed between the person and an NDIA planner; family, carers and advocates may also participate in planning. Where the person provides consent and when necessary, the NDIA planner will review existing assessments as part of the planning process (NDIA, 2014). In the case of vision impairment, this process usually involves the review of an ophthalmology report, which typically provides clinical results such as a summary of the person’s background medical and family history; suspected or confirmed ocular diagnoses; visual acuity; ocular alignment; refraction or need for glasses; ophthalmoscopy or assessment of the posterior section of the person’s eye including the retina and optic nerve; visual fields; and results from any specialised testing such as electrophysiology.

**Determining the severity of vision impairment**

The aim of the review of the ophthalmology report by the NDIA planner is to determine the severity of the vision impairment present, “to ensure the person’s plan provides reasonable and necessary supports “(NDIS Act 2013, p. 4). However, this review can be further complicated by the ~~fact that~~ the NDIA planner ~~may~~ not having expert knowledge of vision impairment nor be skilled at interpreting results from an ophthalmology report. The risk then becomes that the severity of the person’s vision impairment is not as fully realised. This important deficit leads to a lack of alignment between the person’s needs and their support planning, and has been identified as potentially creating inequitable and unaffordable resource allocation for eligible people and broadly across the NDIS (NDIS personal communication, April, 2014).

To begin to address the issues arising from the planning process, a project was convened between the NDIA and key stakeholders in vision impairment, with two aims. First, to reach a consensus position on the interpretation of clinical results and other factors contained in an ophthalmology report to determine the severity of vision impairment, and second, to explore existing tools with which to judge the functional impact of vision impairment. This paper will report on work done to achieve the completion of the first aim.

During 2014, several meetings were convened between members of the NDIA and key stakeholder organisations in vision impairment. A position paper was developed to provide advice for NDIA planners on a method for interpreting clinical results and other factors contained in a standard ophthalmology report to determine the severity of vision impairment. A position paper was developed from the assertion that no single clinical result, for example visual acuity, could be relied upon to reveal the severity of vision impairment, due to a lack of correlation between a single result and the way a person uses vision or is able to function visually (Corn & Lusk, 2010). It was also asserted that visual function as an entity is multifactorial and complex, being determined not only by the internal characteristics of the person, e.g., the challenges posed by eye conditions and the person’s adaptation, but also by such external characteristics as the person’s environment.

To capture the multifactorial and complex nature of vision, the Model of Visual Functioning proposed by Corn (1983) was explored. This model appears in Figure 1.

Figure 1 Model of Visual Functioning, Corn (1983).



This model presented visual functioning in three dimensions including such *visual abilities* as visual acuity, visual fields, ocular motility, brain functions and light and colour perception; *environmental clues* such as colour, contrast, time, space and illumination; and *stored and available individuality* such as cognition, sensory developmental integration, perception, psychological makeup and physical make up. Corn explained the complex relationship between the three dimensions as follows:

to elicit, maintain or maximise visual functioning, each component of all three dimensions must be present in the minimum amount needed to create the volume required by an individual at any given moment to meet the visual demands of a particular task. (p. 374)

Given the clinical nature of ophthalmology reporting, the most readily available information for NDIA planners were the physiological components of visual abilities, i.e. visual acuity at near and distance, and visual fields. Advice on how the NDIA planner could interpret these visual abilities to reach a conclusion about the severity of a person’s vision impairment will now be discussed.

**Determining the severity of vision impairment from visual acuity results**

The World Health Organization International Classification of Disease, Version 10 (ICD-10) categories of vision impairment, found in Table 1 were used as a guide to classify the severity of vision impairment.

Table 1 WHO ICD-10 Classification of Visual Impairment Severity (<http://apps.who.int/classifications/apps/icd/icd10online2004/fr-icd.htm?gh53.htm>+)

|  |  |  |
| --- | --- | --- |
| Category | Presenting visual acuity worse than | Presenting visual acuity equal to or better than  |
| 0 Mild or no visual impairment |  | 6/18 |
| 1 Moderate visual impairment  | 6/18 | 6/60 |
| 2 Severe visual impairment | 6/60 | 3/60 |
| 3 Blindness | 3/60 | 1/60\* |
| 4 Blindness | 1/60\* | Light perception |
| 5 Blindness | No light perception |
| 9 | Undetermined or unspecified |
|  | \*Or count fingers (CF) at one metre |
| If the extent of the visual field is taken into account, patients with a visual field of the better eye no greater than 10° in radius around central fixation should be placed under category 3. For monocular blindness, this degree of field loss would apply to the affected eye. |

This system was modified slightly and the version that appears in Table 2 was applied to the project.

Table 2 Visual acuity categories and the severity of vision impairment used for this project

|  |  |
| --- | --- |
| Mild vision impairment | ≥6/18 |
| Moderate vision impairment | <6/18 to ≥6/60 |
| Severe vision impairment | <6/60 to ≥3/60 |
| Blindness | <3/60 |

To ensure that NDIA planners will have a basic understanding of visual acuity, the following explanations were included in the position paper:

1. A definition of visual acuity, corrected visual acuity and the possible variation of testing in children, adults and people with vision impairment
2. Testing and interpreting near vision and distance visual acuity
3. Explanation of common visual acuity tests, why they are selected, how the results of testing are recorded and the recommended interpretation.

The position paper also included advice on the need to calculate binocular visual acuity. Ophthalmology reports commonly state visual acuity one eye at a time, known as the monocular visual acuity. However, Colenbrander (2003) describes the relevance of binocular visual acuity, or the visual acuity a person has when using both eyes, to fully understanding a person’s visual ability. Using research by Rubin, Munoz, Bandeen-Roche &West (2000) who that found binocular visual acuity can be closely predicted by the person’s monocular acuity, it was recommended that binocular visual acuity be calculated from the visual acuity of the better-seeing eye.

To provide NDIA planners with a quick reference guide, tables were constructed according to visual acuity test type, with the severity of vision impairment indicated by a colour code. Table 3 is an example of one such table where visual acuity has been tested using a Snellen Chart; results for both 6 and 3 metres are provided. The 6 metre equivalent is also included as a guide when a testing distance of less than 6 metres is reported, e.g. the equivalent of 2/60 is approximately 6/180. A similar table is also available in the position paper for LogMAR notations, another common form of recording visual acuity, based on the LogMAR chart system.

Table 3 Binocular Corrected Snellens Visual Acuity Notations

|  |  |  |
| --- | --- | --- |
|  | Visual acuity tested at 6 metres | Visual acuity tested at 3 metres |
| No Vision Impairment | 6/6 | 3/3 |
| 6/7.5 |  |
| 6/9 | 3/4.5 |
| 6/12 | 3/6 |
| Mild Vision Impairment | 6/18 | 3/9 |
| Moderate Vision Impairment  | 6/24 | 3/12 |
| 6/36 | 3/18 |
| 6/48 | 3/24 |
| 6/60 | 3/30 |
| Severe Vision Impairment | Testing distance reduced from 6 metres to 5 metres: 5/60 (6/72 equivalent) |
| Testing distance reduced from 6 metres to 4 metres: 4/60 (6/90 equivalent) |
| Testing distance reduced from 6 metres to 3 metres: 3/60 (6/120 equivalent) |
| Blindness | Testing distance reduced from 6 metres to 2 metres: 2/60 (6/180 equivalent) |
| Testing distance reduced from 6 metres to 1 metre: 1/60 (6/360 equivalent) |
| Testing distance reduced from 6 metres to 1 metre: 1/120 (6/720 equivalent) |

Table 4 is an example of visual acuity notations when the Teller Acuity Cards (TAC) have been used for visual acuity testing, using the most common testing distance of 38cms. As the Teller is an age-normed test, the range of visual acuity that is considered normal for age has been included; for example if a child is aged 14 months and their visual acuity is 6/24 when tested using TAC, their result is considered normal for their age. A visual acuity result that indicates vision impairment is suspected is also included in Table 4; for example if a child is aged 20 months and their visual acuity is 6/60 when tested using TAC, then vision impairment is suspected. Once a child is 37 months or older the severity of vision impairment can be determined using Table 4. This is due to the improved reliability of the child’s response from their behavioural and visual maturity after 36 months.

Table 4 Binocular Corrected Visual Acuity by Teller Acuity Cards tested at a distance of 38 cms

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Birth to 12 months | 13 months to 18 months | 19 months to 24 months | 25 months to 30 months | 31 months to 36 months | 37 months and over |
| Range normal for age | 6/4.56/66/126/156/186/246/306/456/60 | 6/4.56/66/126/156/186/246/30 | 6/4.56/66/126/156/186/24 | 6/4.56/66/126/15 | 6/4.56/66/12 | 6/4.56/6 |
| Vision impairment suspected | 4/603/602/601.5/601/601/80 | 6/456/604/603/602/601.5/601/601/80 | 6/306/456/604/603/602/601.5/601/601/80 | 6/186/246/306/456/604/603/602/601.5/601/601/80 | 6/156/186/246/306/456/604/603/602/601.5/601/601/80 | 6/126/156/186/246/306/456/604/603/602/601.5/601/601/80 |

The ophthalmology report might or might not include clinical results for near vision. Given the importance of near vision as a component of a person’s visual ability, clinical results of near visual acuity have been factored into the determination of severity of vision impairment for this project. The WHO ICD-10 does not currently report near visual acuity, so an arbitrary approach was taken for this project to determine the severity of vision impairment using the N series of near vision, with the categories indicated in Table 5.

Table 5 Near Vision by the N Series

|  |  |
| --- | --- |
| N5 (Highest level near vision) | No Vision Impairment |
| N6 |  |
| N7 | Mild Vision Impairment |
| N8 |  |
| N10 | Moderate Vision Impairment |
| N12 |  |
| N16 |  |
| N18 |  |
| N20 | Severe Vision Impairment |
| N24 |  |
| N32 |  |
| N36 |  |
| N48 (Lowest level near vision) |  |

The potential for a discrepancy between the calculated severity of vision impairment for near vision and distance visual acuity exists. One example might be when a person has binocular visual acuity of 6/60 indicating moderate vision impairment but near vision of N8 indicating mild vision impairment. When such a discrepancy occurs it is recommended that the NDIA planner considers the more severe vision impairment level. For the example provided, the person would be assessed as having moderate vision impairment.

Although at first glance Tables 3, 4 and 5 might appear complex, provided that the NDIA planner has the person’s age, the visual acuity test type/s and the results, they will be able to calculate the level of severity of vision impairment. Two scenarios that demonstrate use of these tables to determine severity of vision impairment are provided below.

Scenario 1

The ophthalmology report indicates that the child is 12 months old and has been tested using the TAC. Visual acuity results are recorded as right eye 6/45 and left eye 6/60. Thus the binocular visual acuity can be estimated at 6/45 and reference to Table 4 shows the child’s visual acuity is within the range normal for their age.

Scenario 2

The ophthalmology report indicates that the person is aged 45 years and has had their near and distance visual acuity tested while wearing their glasses. The results are recorded as right eye with glasses 6/36 and left eye with glasses 6/60 using the Snellen chart. Near vision is right eye N8 and left eye N10. Binocular distance visual acuity can be estimated at 6/36 and near vision as N8. Reference to Table 3 and 5 indicates that the severity of the vision impairment is moderate.

**Determining the severity of vision impairment when visual acuity and visual fields are affected**

The WHO ICD-10 has been criticized for limited classification of vision impairment based on visual field loss (Dandona & Dandona, 2006). As such, the ICD-10 categories were modified for this project and appear in Table 6. Visual field loss can occur in a variety of areas within a person’s visual field and the impact on a person’s visual ability relates to this affected area. Further, two possible scenarios exist where a person may have visual field loss with normal visual acuity, or a combination of both visual field loss and reduced visual acuity. In the second scenario the impact on the person’s visual abilities will be greater given both physiological components are involved. Table 6 allows the NDIA planner to determine the severity of vision impairment based on the affected area of the visual field and whether or not the person’s visual acuity is reduced.

Table 6: Calculation of vision impairment severity when Binocular Distance Visual Acuity and Visual Field Defects are reported

|  |  |
| --- | --- |
| **Moderate Vision Impairment** | Binocular visual field of < 20 degreeswith visual acuity of 6/6, 6/7.5, 6/9 or 6/12, 6/18, 6/24 or 6/36Visual field loss of Homonymous Hemianopia with visual acuity of 6/6, 6/7.5, 6/9 or 6/12 |
| **Severe Vision Impairment** | Binocular visual field of < 20 degreeswith visual acuity of 6/60, 5/60, 4/60, 3/60 2/60 or 1/60Binocular visual field of < 10 degrees, regardless of visual acuity levelVisual field loss of Homonymous Hemianopia with visual acuity level less than 6/18 |

The interpretation of visual field results can be challenging, so the recommendation has been made in the position paper that expert opinion be sort when other types of visual field defects are reported.

**Adjustments to the determination of the severity of vision impairment**

Such clinical results as visual acuity and visual fields are commonly available in an ophthalmology report. However, there are several identified limitations in applying these results to determine the severity of vision impairment. Colenbrander (2010) comments that these tests provide a threshold parameter for the physiological function being measured, but that they are not necessarily indicative of a threshold performance or “the most relevant performance level for activities of daily living “

(p. 165). This is reinforced by the International Council of Ophthalmology’s (2008) position on visual function and functional vision, or the person’s visual reality. The Council has acknowledged a significant margin exists between such threshold parameters (such as visual acuity and visual fields) and sustainable performance, and depending on the activity, the margin may have an impact on the person’s comfort when related to activities such as reading, or an impact on the person’s safety when related to such activities as driving.

To reduce the margin between the clinical results and the person’s visual reality, the decision was made (where possible), to adjust the determination of the severity of vision impairment to incorporate the impact of additional factors experienced by people with vision impairment. This included:

1. Adjusting for nystagmus, photophobia and visual fatigue.

It is well recognised that people with vision impairment frequently experience nystagmus, photophobia and visual fatigue, and that these factors in isolation or in combination will significantly worsen the person’s visual ability as indicated by the recorded visual acuity and visual fields. To adjust for the impact of nystagmus, photophobia and/or visual fatigue, it is recommended that the severity of vision impairment be determined as one level lower than indicated from visual acuity and visual field results. This is demonstrated in Figure 2.

Figure 2 Adjustment of severity of vision impairment

Adjusted Severity of Vision Impairment when nystagmus, photophobia and/or visual fatigue are reported

Moderate

Severe

Blindness

Severity of Vision Impairment from Visual Acuity and/or Visual Fields

Mild

Moderate

Severe

1. Adjustment for Cortical Vision Impairment

It is recommended that any person who has been diagnosed with Cortical Vision Impairment (CVI) be considered to have severe vision impairment, regardless of the reported visual acuity and visual fields. This adjustment to the severity level of their vision impairment accommodates the characteristic behaviours associated with CVI and their ongoing interference with visual functioning despite the person’s visual acuity (Roman-Lantzy, 2007.

1. Adjustment for Dual Sensory Loss or Deafblindness

It is recommended that any person who has been diagnosed with Dual Sensory Loss or Deafblindnessbe considered to have severe vision impairment, regardless of the reported visual acuity and visual fields. This adjustment to the severity level of their vision impairment accommodates for the combined influence of vision and hearing impairment.

1. Adjustment for a deteriorating eye/vision condition

Some people will be diagnosed with eye conditions that will deteriorate in the future to severe vision impairment and blindness. These people may initially have clinical results that are within normal limits, despite their diagnosis. The onset of the vision loss maybe sudden and severe, so these people should be considered to have moderate vision impairment from the time of their diagnosis. Examples of eye conditions that are known to deteriorate include Age Related Macular Degeneration (wet and dry); Retinal Dystrophy; Retinitis Pigmentosa; Stargardt’s Disease; Stickler’s Syndrome; High Myopia and Retinal Detachment.

1. Adjustment for non- participation in vision assessment

It may not be possible to test a person’s visual abilities, especially in the case of people with multiple disabilities. In this situation, the ophthalmology report may refer to observed visual behaviours such as fixing and following or the person turning their eyes to a light source. In this situation, it is recommended that the person should be considered to have severe vision impairment until future retesting indicates otherwise.

A final recommendation made in the position paper relates to people who have brain injury with intact visual acuity and visual fields, but have a disturbance to specific areas of their visual functioning, for example altered visual recognition, perception. and eye movement defects. It is recommended that expert opinion be sort to determine the severity of vision impairment in these people due to the complex nature of their visual ability.

**Discussion**

This paper has presented the results of formal discussions between the NDIS and key Australian stakeholder organisations in vision impairment. The approach that was taken utilised the clinical results from an ophthalmology report to determine the severity of a person’s vision impairment, with adjustment for the additional factors that are known to impact on visual ability. This adjustment is fundamental to recognising the complexity of visual function and reaching an outcome for the person with vision impairment that meets the NDIS objective of “reasonable and necessary support” (NDIS Act 2013, p. 4).

Several limitations of this approach are evident. First the method only reports on one dimension of the Corn Model of Visual Functioning, i.e. visual abilities. The utility of an NDIS plan for a person with disability is that it links to the person, not their health condition. As Rubin, Munoz, Bandeen-Roche, and West (2000) comment “disability is defined at the level of the entire individual” (p. 3327). It is anticipated that future planned work in the area of the functional impact of vision impairment may go some way to addressing the other dimensions of the Corn Model of Visual Functioning.

Second, the use of this method will only be successful if NDIA planners have a level of understanding about vision impairment. It is anticipated that a training module will accompany the final guide for NDIA planners. Third, the method described in this paper has not yet been evaluated due to the immediate roll out of the NDIS. Further work is planned to examine the application of the proposed method. Finally, once the method has been evaluated it could potentially be used in other situations where the severity of vision impairment needs to be determined from ophthalmology reports such as allocation of educational support in schools.

All parties who have been involved in this project are acknowledged and thanked for their participation and commitment. The author hopes that work such as this project will facilitate the understanding of clinicians and administrators in the area of vision impairment and generally in the field of disability.

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