MR. KHYBER ALAM (Orcid ID : 0000-0001-7779-0467)
PROF. SHARON BENTLEY (Orcid ID : 0000-0003-0146-4248)

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TITLE: Developing consensus-based referral criteria for low vision services in Australia

Authors: Khyber Alam,[1] Heather Connor,[1] Alex Gentle,[1] Sharon A. Bentley[2]

Institutions:

1. School of Medicine, Deakin University, Geelong, Australia
2. Centre of Vision and Eye Research, School of Optometry and Vision Science, Queensland University of Technology, Brisbane, Australia

Corresponding Author:
Khyber Alam
Email: alam.khyber@uwa.edu.au

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Running head: Low Vision Referral Criteria

Key words: low vision, visual impairment, referral guidelines, consensus, Delphi

Abstract

Purpose: To develop expert consensus on referral criteria for low vision services in Australia.

Methods: In a modified online Delphi process, a panel of 38 Australian experts in low vision (including ophthalmologists, optometrists, orthoptists, occupational therapists, orientation and mobility professionals, researchers and managers) participated in three rounds of consensus building over a period of five months commencing in 2019. Initially, 90 statements were developed, addressing what should be included in best-practice low vision referral criteria, currently used criteria, timing of referral and responsibility for referral. By the third round, these had been reduced and refined to a total of four statements.

Results: In three Delphi rounds, the expert panel produced three key recommendations for low vision referral: 1) that low vision referral should be based mainly on the impact of uncorrectable vision impairment on function and well-being; 2) clinical measures of visual acuity and visual field might be a secondary consideration and 3) it is important to fully inform a person about low vision services at an early stage of vision loss and to involve them in decision making about referral. There was consensus on the need for clear referral pathways and that both ophthalmologists and optometrists have primary responsibility to refer for low vision services.

Conclusions: Although recommendations and guidelines should not replace sound individual clinical judgement, promotion and adoption of these consensus

recommendations could assist health care professionals in providing appropriate and timely referral for low vision services to the benefit of people with vision impairment.

Key Points

- A person should be considered for low vision services if they have uncorrectable vision loss that impacts their ability to perform activities of daily living, or impacts their safety and / or well-being. It is important to inform a person about low vision services at an early stage of vision loss.
- These consensus-based recommendations will assist health care professionals to provide appropriate, timely and person-centred referral for low vision services.
- The utilisation of consensus-based referral recommendations could increase access and uptake of low vision services, which are known to improve quality of life for people with vision impairment.

INTRODUCTION

Vision loss can affect every aspect of life, including education, driving, employment and social and family life.[1] It has been associated with falls,[2] depression[3] and admission to residential aged care facilities.[4] However, there is good evidence that low vision rehabilitation services are effective for people with vision impairment,[5-8] enhancing independence and the ability to perform activities of daily living. Even so, referral rates are less than 11%,[9] and the uptake of low vision rehabilitation services in Australia is less than 20% of those who might benefit.[10] Studies have found that this is partly due to misunderstanding about the level of vision loss needed for referral to low vision services, the lack of clear low vision referral guidelines and poor coordination between eye care practitioners.[10-12] Indeed, there is considerable variability in the referral criteria used by practitioners both in Australia and other countries.[13-16] There is no consensus on when patients should be referred or what the referral criteria should be. Establishing clear, agreed referral criteria for low vision rehabilitation could assist with raising awareness about the services available, increase the likelihood of timely referral and access to services, increase uptake of services and improve quality of life for those with vision impairment.

The Vision Rehabilitation Committee of the American Academy of Ophthalmology (AAO) developed the SmartSight model in 2003 to provide guidance to ophthalmologists on referral for low vision rehabilitation services.[17] In the model, it is acknowledged that visual acuity alone is not helpful for deciding whether or not a patient might benefit from services, and that many other aspects of visual function and patient needs should be taken into account to determine the most appropriate intervention. The AAO recognised the importance of referral and recommended that comprehensive services should not be reserved for people with severe vision impairment because patients with moderate vision loss can also benefit, especially those who have progressive vision impairment.[17,18] The SmartSight model emphasises that all eye care practitioners should be able to at least "recognize" and "respond" to patients that report difficulty with visual tasks or present with visual acuity worse than 6/12 in the better eye, contrast sensitivity loss, a scotoma or visual field loss. Practitioners are also encouraged to either manage or refer patients who are experiencing difficulty with activities and life goals.[18] This model has been adopted in the USA and Canada, and promoted in New Zealand.[18-21]

Similarly, a multidisciplinary eight-person Netherlands commission was formed to develop the first European evidence-based low vision referral guidelines.[22] The commission commenced with consideration of the World Health Organization (WHO) definition of mild visual impairment (presenting visual acuity in the better eye of worse than 6/18 or visual field loss within 30 degrees of fixation).[23] The final recommendation was that, "persons with a visual acuity < 0.5 decimal equivalent, reading acuity < 0.25 decimal equivalent, visual field defects within 30 degrees of fixation or other severe defects in the visual field, such as hemianopsia and relevant vision-related problems in daily life that cannot be addressed by interventions in the standard ophthalmic practice and that can potentially be solved by visual rehabilitation, should be considered for referral to forms of visual rehabilitation".[22] However, this work was based on a review of the literature published prior to 2000 and, at the time, most of the evidence available was of low-quality.

Keeffe *et al*.[13,14] conducted studies on criteria used by Australian ophthalmologists and optometrists to refer patients for comprehensive low vision rehabilitation. A representative sample comprising 169 of the 612 registered ophthalmologists at the

time was surveyed.[13] Results suggested that the majority of ophthalmologists used referral criteria of 6/21 or worse visual acuity and less than 10 degrees for patients with visual field loss. Similarly, in a parallel study of 288 optometrists, the majority used a referral criterion of 6/21 or worse visual acuity.[14] These criteria represent moderate to severe impairment (legal blindness in the case of the visual field criterion), whereas patients with milder impairment may experience difficulties with reading and activities of daily living that could be addressed through low vision rehabilitation. Importantly, these studies were undertaken more than 20 years ago, and it is possible that ophthalmologists and optometrists now use different referral criteria.

In a recent survey of 229 optometrists in the USA on practice patterns and barriers to referral for low vision rehabilitation services,[15] optometrists who were not low vision rehabilitation practitioners often failed to refer patients with mild vision loss (visual acuity of 6/15 to 6/21) or prescribe any magnifiers for patients with visual acuities of 6/7.5 to 6/12. Compared with those who sometimes practiced low vision rehabilitation, twice as many optometrists who did not practice low vision rehabilitation reported that they never prescribed near-reading additions of +4.00 dioptres or more.[15] Almost one-third of the respondents stated that, “it is not feasible to stock magnifiers in office”.[15] These findings reveal that a considerable number of eye care service providers are perhaps overlooking the importance of referral for low vision rehabilitation as an option and are not prescribing near-vision adds or magnification devices for patients with mild vision impairment. Similarly, a survey in the UK found differences among eye care professionals in their understanding of the available options for patients with vision loss, suggesting a need to develop standardised referral pathways across the UK.[24]

Further insights come from the characteristics of patients who accept referral and attend low vision services. A clinical audit of 155 new patients attending the Kooyong Low Vision Clinic in Australia revealed that the mean presenting distance visual acuity of patients attending the low vision clinic was 6/24.[25] Goldstein *et al.* conducted a prospective observational study to investigate the characteristics of 764 new patients seeking low vision rehabilitation services at 28 private clinics across the USA.[26] The study found that more than one-third of the patients (37%) had mild

vision impairment with habitual visual acuity of 6/18 or better, and a similar proportion (38%) had vision impairment in the 6/21 to 6/60 range, suggesting perhaps that patients are referred and accept referral slightly earlier in the USA than in Australia.

Although a number of studies suggest a visual acuity criterion, very few have specifically investigated a visual field criterion for low vision referral. One investigation recommended that patients with visual field 31° to 52° degrees in diameter might benefit from referral for mobility rehabilitation, as patients at this stage of visual field loss were at risk of having inadequate mobility for independent travel, being both unsafe (bumping into objects) and inefficient (slow).[27] In another study, members of the American Glaucoma Society were surveyed to determine referral criteria used by glaucoma specialists. The top two referral criteria used were difficulty performing activities related to vision (78%) and extent of visual field defects (63%).[28] No details were provided on the extent of visual field impairment; however, it should be acknowledged that glaucoma specialists are less likely to collect information about functional binocular fields, being mostly concerned with threshold, monocular testing.

In deciding what appropriate referral criteria should be, definitions of vision impairment developed by a range of organisations for the purposes of healthcare reimbursement, driver licensing, disability benefits and research could also be considered. For example, the definition of vision impairment established by the Centers for Medicare and Medicaid (CMS) for medical coding and billing services in the USA was visual acuity less than 6/18 in the better eye or certain visual field loss.[29] In Australia, Medicare item number 10942 was introduced in 2005 to remunerate and support optometrists more appropriately to provide low vision care, with the eligibility criteria being best corrected visual acuity of 6/15 or N12 or worse in the better eye, or horizontal visual field of less than 120 degrees within 10 degrees above and below the horizontal midline. These distance visual acuity and visual field criteria are broadly consistent with private driver licensing requirements in Australia (visual acuity with one or both eyes better than 6/12, or visual field of at least 110 degrees within 10 degrees above and below the horizontal midline).[30] In fact, consistent with the driving standard, many Australian studies on the epidemiology of

vision impairment use a criterion of the better eye being worse than 6/12 as a cut-off.[31-33] Alternatively, most global studies have used the previous WHO definition of mild visual impairment (better eye worse than 6/18).[34,35] In Australia, disability pension benefits are provided to those with permanent blindness whose visual acuities are worse than 6/60 in both eyes or their visual field constricted to within 10 degrees of fixation in the better eye.

The current evidence suggests both considerable variability in criteria and a lack of use of referral criteria for low vision rehabilitation services in Australia. Although various visual acuity criteria dominate the literature, a referral criterion primarily based on visual acuity would be problematic as patients have different goals, and therefore different needs for services, even if they have the same level of visual acuity and function. The aims of rehabilitation services include maximisation of remaining vision through optical aids, orientation and mobility training, adaptive devices and psychosocial support.[36] Therefore, referral criteria based on difficulty with reading, mobility problems, driving issues and symptoms of stress or depression might be more appropriate. However, there is often an adjustment process that must also be considered, with variation in when patients are ready to accept referral for services. This complexity of factors is perhaps why well-defined referral guidelines are lacking.

To improve referral rates and uptake of services, clear and consistently applied guidelines are needed. Given the individual and complex factors involved, determining and demonstrating the validity of specific criteria is challenging. However, one option is to develop guidelines based on expert consensus. The aim of this study was to develop referral guidelines for low vision services based on expert consensus by considering currently used criteria, best-practice criteria, timing of referral and who should be responsible for referral.

METHODS

A modified online Delphi process was used for the study. The Delphi technique is a widely used and accepted method for achieving convergence of opinion concerning real-world knowledge solicited from experts within a certain topic area.[37,38] Consensus is built by using a series of questionnaires to collect data from a panel of

selected experts. The process is iterative, with a series of rounds, and involves feedback.

Participants

Purposive sampling was used to recruit a panel of 39 Australian experts in low vision (including ophthalmologists [8%], optometrists [24%], orthoptists [18%], occupational therapists [16%], orientation and mobility professionals [13%], researchers [5%], teaching academics [13%] and managers of low vision organisation [3%]) from The University of Melbourne, Deakin University, The University of New South Wales, Royal Hobart Hospital Low Vision Clinic, the Australian College of Optometry, Vision Australia, Glaucoma Australia and private practices. Panel members participated in three rounds of consensus building over a period of five months commencing in October 2019.

Delphi rounds

Round one comprised the following eight open-ended questions developed by the research group:

1) When do you think people with vision impairment should be referred for low vision services and supports? Does it depend on their vision, cause of vision loss, stage of life, circumstances etc?
2) Does your organisation have referral criteria and if so, what are they?
3) Do you think there should be a visual acuity criterion for low vision referral, and if so, what should it be? Please explain your reason(s).
4) Do you think there should be a visual field criterion for low vision referral and if so, what should it be? Please explain your reason(s).
5) Should there be some other criteria (e.g., difficulty with activities of daily living/ functional performance)? If so, what should those criteria be and why?
6) Should there be different criteria or guidelines for different eye diseases? (e.g., macular degeneration vs. glaucoma)
7) Who should refer / be responsible for referring to low vision services?
8) Do you have any other comments?

After receiving responses from participants, two researchers extracted and converted the data into a structured questionnaire for use in round two.

In the second round of the Delphi survey, panelists were asked to review the outcomes from the first round. Next, for each statement, panelists were either asked to rate, “How important you think it is to include each of the statements below in a recommendation or set of criteria for when a person with vision impairment should be referred for low vision services and supports”, on a five-level scale (where 1 = not important, 2 = slightly important, 3 = moderately important, 4 = important and 5 = very important) or, “Please rate your level of agreement with each of the statements below”, on a five-level Likert scale (where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree). To obtain further insights, opportunities to add comments and suggest additional statements were also provided.

In a third round, panellists were required to review group ratings for each statement from the previous round. In addition, statements that met the criterion for consensus were synthesised and presented as a set of possible referral criteria for low vision services. Panellists were asked to indicate their level of agreement with each statement (where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree) and provide additional comment, with the opportunity to retain, amend or reject any of the statements from the final referral criteria.

The initial criterion for consensus used to determine whether or not a statement should be incorporated into the final referral criteria was 70% of panellists responding either ‘agree’ or ‘strongly agree’, or ‘important’ or ‘very important’.[39] However, given the high number of statements with over 70% ‘agree’ or ‘strongly agree’, the mean and standard deviation of ratings were also used.[39] A mean rating of 4.5 or greater was selected as an overall indicator of importance.

Procedure

Each round of the Delphi survey was conducted online using the Qualtrics^{XM} software (Qualtrics, qualtrics.com). Participants were required to complete each round within two weeks of receiving the email invitation. For each round, a reminder email was sent to participants five days before the survey closed.

The study was approved by the Deakin University Human Research Ethics Committee (approval number: 2018-328) and adhered to the tenets of the Declaration of Helsinki. Informed consent was obtained prior to participation.

RESULTS

The results for each Delphi round, including the number of panelists responding, are shown in *Figure 1*.

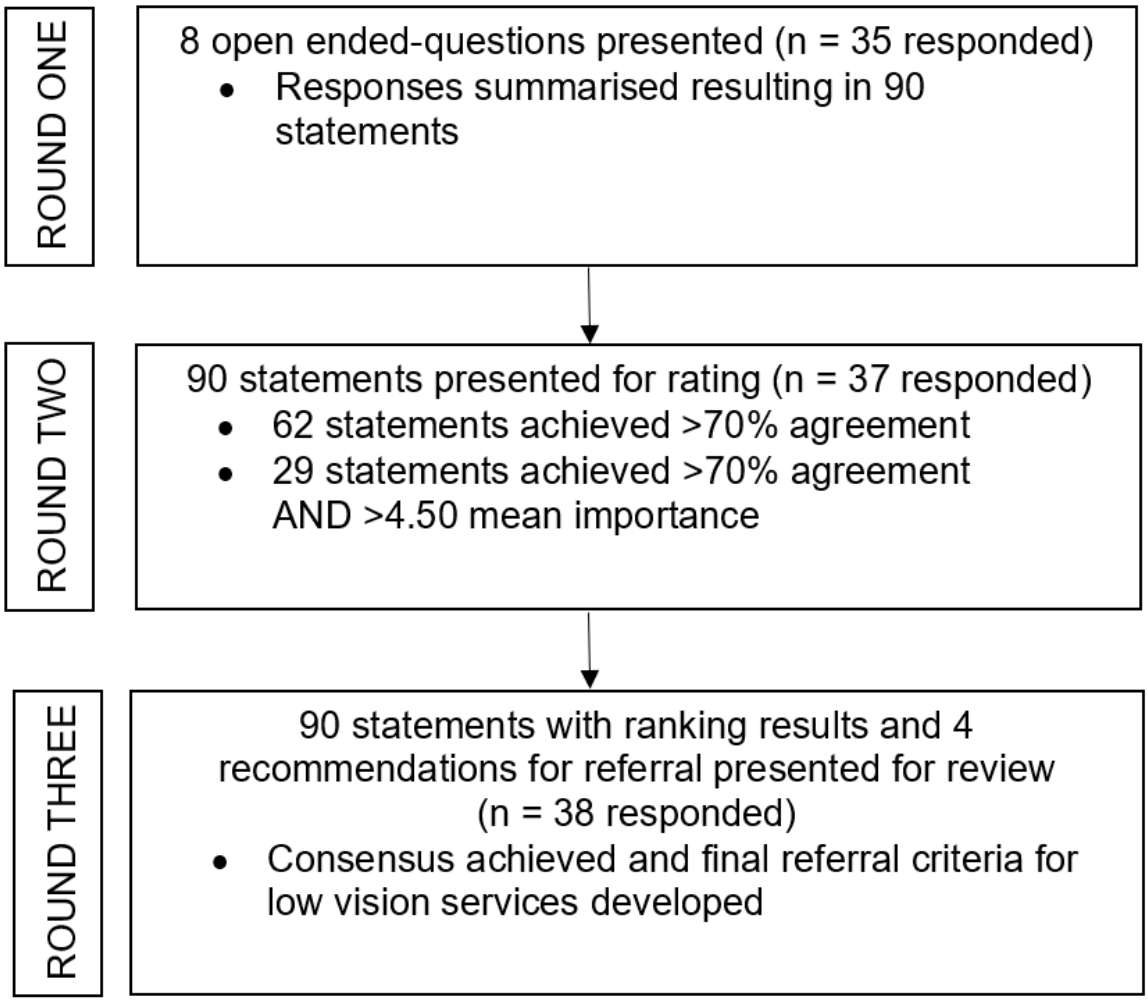

Figure 1. Overview of results of Delphi rounds and response rates.

In response to the eight open-ended questions, a total of 90 statements were compiled and rated (see *Tables 1 to 8* below for results). From this and based on the criteria for expert consensus described above (frequency of agreement *and* mean

importance), four recommendations for low vision referral criteria were developed and presented to panelists.

Table 1: Results for question 1: When do you think people with vision impairment should be referred for low vision services and supports? Does it depend on their vision, cause of vision loss, stage of life, circumstances etc.? Please rate how important you think it is to include each of the statements below in a recommendation or set of criteria for when a person with vision impairment should be referred for low vision services and supports.*

	Statement	Mean rating	Std deviation	% important or very important
1	When a person has difficulties with activities of daily living.	4.94	0.24	100%
2	When vision loss impacts on a task (e.g. driving, reading, mobility, cooking).	4.91	0.28	100%
3	As soon as there is an impact on safety.	4.85	0.35	100%
4	The person should be fully informed and be involved in the decision.	4.85	0.35	100%
5	When vision loss impacts quality of life.	4.82	0.45	97%
6	If an older person with vision impairment might be at risk for falls.	4.71	0.52	97%
7	Both clinical vision measures and visual function should be used as criteria for referral.	4.65	0.64	91%
8	When a person cannot function independently.	4.62	0.73	85%
9	If the person is a child.	4.52	0.82	85%
10	When a person cannot do what they want to do with an ordinary pair of glasses.	4.47	0.85	91%
11	When a person is 'legally blind'.	4.32	0.99	82%
12	Early intervention is important.	4.32	1.05	77%
13	When a diagnosis is made, and progression of vision loss is expected.	4.21	0.93	82%
14	If someone lives alone or they are a carer for someone else.	4.15	0.99	79%
15	As soon as there is an impact on productivity.	4.15	0.84	77%
16	It depends on individual circumstances.	4.09	0.93	76%
17	Visual acuity alone is not a good guide.	3.97	0.92	75%
18	When a standard consultation is not meeting the person's needs.	3.91	0.98	74%
19	When a person's vision falls below the driving standard.	3.88	1.11	59%
20	When a person cannot do what they want to do with an ordinary pair of glasses, even if they are waiting for treatment (e.g. cataract surgery).	3.79	0.99	53%
21	Clinical measures of vision (e.g. visual acuity) are poorly correlated with overall visual function.	3.68	1.03	61%
22	Contrast sensitivity would be a better measure than visual acuity.	2.91	1.01	24%
23	Only visual function (e.g. impact on activities of daily living) should be used as a criterion for referral.	2.47	1.09	21%
24	Only clinical vision measures should be used as criteria for referral.	1.94	0.84	3%

***** Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

There was unanimous support for a functional criterion based on ability to perform activities of daily living and to do so safely (*Table 1*). This is related to quality of life and independence, which were also rated highly for importance. Safety considerations encapsulate more specific concerns about the risk of falls among older people with vision impairment. The panel agreed and rated the inclusion of children as highly important. There was strong agreement that both clinical measures *and* visual function should be included in referral recommendations. The panel unanimously agreed that people with vision impairment should be fully informed and involved in decisions about referral for low vision rehabilitation.

Table 2: Results for question 2: Does your organisation have referral criteria and if so, what are they? Please rate how important you think it is to include each of the statements below in a recommendation or set of criteria for when a person with vision impairment should be referred for low vision services and supports.*

	Statement	Mean rating	SD	% important or very important
25	When the person has difficulties with activities of daily living.	4.79	0.47	97%
26	When the person has low vision or is blind.	4.56	0.77	88%
27	When a person has a permanent, non-correctable and progressive eye condition.	4.39	0.95	88%
28	When a person has non-correctable eye condition and their functional vision affects everyday life, or visual acuity worse than 6/12, or visual fields less than 30 degrees.	4.36	0.95	88%
29	When the person can't do what they want to do with ordinary spectacles.	4.21	0.80	82%
30	Information about services should be provided at the time of diagnosis.	4.18	0.82	74%
31	When a person no longer meets the driving standard (worse than 6/12).	3.58	1.16	58%
32	When the person has glaucoma - for education and support.	3.44	1.12	47%
33	It depends on many factors but roughly visual acuities of worse than 6/18.	3.33	1.17	39%

* Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

Only 51% of the panel reported that set referral criteria were used in their organisation and most criteria were broad and non-specific (*Table 2*). Of the organisational criteria used, “when the person has difficulties with activities of daily living” was the most frequently endorsed, which was consistent with the first question about what the referral criteria should be.

Table 3: Results for question 3: Do you think there should be a visual acuity criterion for low vision referral, and if so, what should it be? Please rate your level of agreement with each of the statements below.*

	Statement	Mean rating	SD	% important or very important
34	If there is a visual acuity criterion, we need to avoid sending the message that a person MUST be below the criterion for referral.	4.56	0.83	94%
35	No, a holistic picture of visual function is needed.	4.52	0.74	91%
36	If there is a visual acuity criterion, it should be possible to refer earlier if necessary.	4.32	0.96	84%
37	No, there is too much individual variability in visual needs.	4.15	0.78	88%
38	No, setting a visual acuity criterion could delay an important referral.	4.06	0.89	82%
39	No, there is too much individual variability in satisfaction with vision.	4.03	0.83	79%
40	No, visual acuity is an inadequate measure of visual function.	3.58	1.18	58%
41	Yes, service providers need a guideline.	3.13	1.22	50%
42	Yes, a visual acuity criterion would be helpful to service providers who do not frequently see low vision patients.	3.12	0.98	42%
43	Yes, the criterion should be related to driving standards (worse than 6/12).	2.47	1.12	22%

*Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

Table 4: Results for question 4: Do you think there should be a visual field criterion for low vision referral and if so, what should it be? Please rate your level of agreement with each of the statements below.*

	Statement	Mean rating	SD	% important or very important
44	If there is a visual field criterion, we need to avoid sending the message that a person MUST be below the criterion for referral.	4.48	0.84	94%
45	If there is a visual field criterion, it should be possible to refer earlier if necessary.	4.29	0.85	87%
46	No, there is a need for a holistic picture of visual function and whether the patient is having problems regardless of visual field loss.	4.25	1.06	81%
47	No, early intervention is important. A set VF criterion may delay what could be an important referral.	4.09	0.95	78%
48	No, a functional criterion is a more reliable indicator.	3.75	1.27	69%
49	Yes, if visual field loss impacts driving even if their VA is normal.	3.66	0.99	59%
50	Yes, service providers need a guideline.	3.03	1.10	34%
51	No, visual field is an inadequate measure of visual function.	2.97	1.16	31%
52	Yes, the criterion should be related to driving standards: any VF less than 100 degrees horizontally could be referred. Also, any central vision loss within 5-10 degrees of fixation as this could impact reading.	2.75	1.00	19%
53	There should be a criterion and it should be based on the WHO criterion of visual impairment.	2.81	0.98	19%

*No statements met both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50).

When asked specifically about a visual acuity criterion (*Table 3*), there was agreement that there is a need to avoid sending the message that a person must be below the criterion for referral, and that it should be emphasised that cases with milder vision impairment may also benefit from referral. A holistic picture of visual function was rated as important. While a similar response to having a visual field criterion was highly endorsed (*Table 4*), it just failed to meet the cut-off for agreement based on both percent rating and mean rating.

Table 5: Results for question 5: Should there be some other criteria (e.g., difficulty with activities of daily living/ functional performance)? If so, what should those criteria be and why? Please rate how important you think it is to include each of the statements below in a recommendation or set of criteria for when a person with vision impairment should be referred for low vision services and supports.*

	Statement	Mean rating	SD	% important or very important
54	Yes, when a patient is unable to carry out daily living activities due to their vision loss.	4.81	0.47	97%
55	Yes, look for red flags such as reduced ability to recognize faces, lack of confidence with getting around and other difficulties with performing activities of daily living.	4.74	0.62	97%
56	Yes, look for negative impacts on ability to function safely or if there are threats to their mental health and feeling of well-being.	4.68	0.69	94%
57	Yes, when a patient is unable to drive/ function independently at home due to worsening vision.	4.61	0.55	97%
58	Yes, a holistic assessment of one's ability to independently carry out all activities of daily living.	4.57	0.80	93%
59	Yes, when visual aids such as spectacles are not helpful anymore.	4.32	0.78	94%
60	Yes, if visual field loss impacts driving even if their VA is normal.	3.74	1.01	59%
61	No, early intervention is important. A criterion may delay what could be an important referral.	3.33	1.22	53%
62	No, I don't think it is feasible for practitioners to assess this in a 20-minute consultation.	2.68	1.25	23%

*Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

In response to the question about any additional considerations ("Should there be some other criteria?"), the top ranked suggestions again related to being able to perform activities of daily living independently and safely, such as recognising faces, getting around and driving (*Table 5*).

Table 6: Results for question 6: Should there be different criteria or guidelines for different eye diseases? (e.g., macular degeneration vs. glaucoma) Please rate your level of agreement with each of the statements below.*

	Statement	Mean rating	SD	% important or very important
63	No, patients with the same eye condition may still have very different needs, wants and goals.	4.61	0.55	97%
64	No, patients should be referred irrespective of the condition.	4.55	0.76	90%
65	No, a criterion based on eye disease carries the risk of excluding people who doesn't meet the criteria but requires the services.	4.42	0.71	94%
66	No, keep it simple.	4.32	0.93	84%
67	No, not necessary.	4.19	0.86	77%
68	No, the visual field and acuity guidelines should suffice and encompass all diseases.	3.45	1.13	52%
69	Yes, different diseases have different impact.	3.37	0.95	43%
70	Yes, patients with different eye diseases experience different problems.	3.30	1.10	43%

*Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

Although different eye conditions can have a different impact, there was strong agreement that there should not be different referral criteria for different eye conditions (*Table 6*). Patient needs and goals were considered more important than the nature of the impact of the eye condition.

Table 7: Results for question 7: Who should refer / be responsible for referring to low vision services? Please rate your level of agreement with each of the statements below.*

	Statement	Mean rating	SD	% important or very important
71	Ophthalmologists	5	0.00	100%
72	Optometrists	5	0.00	100%
73	Orthoptists	4.74	0.67	94%
74	Referral should be the responsibility of all practitioners involved	4.62	0.72	86%
75	General Practitioners	4.55	0.71	87%
76	Self-referral	4.55	0.61	94%
77	Family	4.48	0.71	94%
78	Allied Health Practitioners	4.35	0.90	84%
79	School Teachers/Nurses	4.03	1.18	71%

*Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

There was unanimous agreement that both ophthalmologists and optometrists should be responsible for referring patients with vision impairment to low vision rehabilitation services (*Table 7*). Other people considered important in the referral process were orthoptists and general practitioners, as well as the patients themselves.

Table 8: Results for question 8: Additional comments of participants from round 1. Please rate your level of agreement with each of the statements below.*

	Statement	Mean rating	SD	% important or very important
80	Vision Australia services are very beneficial to people with newly diagnosed eye conditions because often they just want to unpack the grief and loss around the new diagnosis and fears about going completely blind, which is rarely dealt with. Low vision services can strengthen and empower people for their future independence, prevent depression and equip people to live meaningful lives to actively engage in school, work and volunteer work.	4.65	0.54	97%
81	Referrers should be reminded to re refer if the patient's circumstances change as different services may apply.	4.58	0.61	100%
82	Early referral can be reassuring for patients as they can be made aware of services to help the patient maintain their preferred level of independence even prior to needing them and this can reduce some of the anxiety around vision loss.	4.58	0.49	94%
83	More involvement of low vision services and the benefits they can provide through education sessions would help.	4.48	0.67	97%
84	Referral pathways are extremely important, and something all organisations could benefit from knowing more about, and particularly for the individuals experiencing vision loss or blindness.	4.48	0.56	90%
85	More education on availability of services is critical to get better referral pathways happening. The education should emphasise the fact that these services are usually provided at no cost and that the patient can say no at any time if they don't wish to proceed.	4.45	0.84	90 %
86	I have worked in numerous Ophthalmology practices and seen a lot of people from diverse cultural backgrounds with vision loss. However, the majority of people who attend low vision services do not come from diverse backgrounds. I think it would be interesting to know if these people are not being referred or rather if there are some cultural reasons why they do not access low vision services.	3.93	0.96	73%
87	The referrals are not made due to lack of knowledge of the eye disease, knowledge of the process of referral and an understanding of the benefits and scope of assistance low vision organisations can provide.	3.90	0.96	71%
88	Try and make the process as automated as possible.	3.55	1.01	58%
89	Eye care professionals should not tell their patients that their glasses are not helpful anymore as it can determine the success with magnification.	3.16	0.92	39%

90	Eye practitioners have poor understanding of the nature of vision loss in a pathological eye, which is clearly illustrated by the ongoing emphasis on VA as a measure of visual function.	2.84	1.14	32%

*Statements meeting both the frequency of agreement criterion (>70%) *and* the mean importance criterion (>4.50) are shaded grey.

Other important issues raised were support for mental health problems related to vision loss, the need to re-refer patients if needs change and that early referral can be reassuring and prepare patients for progression of vision impairment (*Table 8*).

The majority of panellists were cautious about the use of specific visual acuity and visual field criteria and considered that these should not prevent a person from being referred if vision was better than the defined criteria. Therefore, two recommendations were presented back to the panel in round three, one based on function *and* one based on visual acuity and visual field criteria (*Table 9*). As the measurement of visual fields, the type of visual field impairment and the quantification of visual fields can vary greatly, two options were provided within the recommendation on visual fields, one leaving interpretation to the clinician ('uncorrectable visual acuity worse than 6/12 in the better eye, or equivalent visual field loss') and one based on the private driver licence standard.

In synthesising these results and presenting recommendations to the expert panel, the researchers considered it essential that the criteria or guidelines be simple and concise to promote uptake and translation to practice. Three statements related to referral criteria were generated. In addition, given the similarity of the criteria to those in the SmartSight model, the tiered approach of the model (i.e., different 'levels' of provision), its applicability to all eye care practitioners and its promotion in countries with a similar economy and health care system, information about the model and a question about the appropriateness of the SmartSight model in Australia was included in round three. The responses of the panel are provided in *Table 9.*

Table 9: Low vision referral recommendations (round 3).

1. Do you agree with the following statements as recommended low vision referral criteria? Note that it is likely more than one recommendation statement will be required.							
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Mean**	**SD**

A person should be considered for low vision services if they have uncorrectable vision loss that impacts their ability to perform activities of daily living, or that impacts their safety and / or well-being.	0%	6%	0%	8%	86%	4.74	0.73
2. Should the following statement accompany the statement above?							
The person should be fully informed at an early stage and involved in decision making about the need for low vision services.	0%	0%	3%	29%	68%	4.66	0.53
3. Should the following statement be an additional recommendation?							
Uncorrectable visual acuity worse than 6/12 in the better eye, or equivalent visual field loss (or visual field loss worse than the private driver licence standard).	6%	23%	44%	18%	9%	3.00	1.00
4. Can the SmartSight model serve as a referral pathway guideline in Australia?							
Yes	88%						
No	12%						

There was strong agreement (86%) that, “A person should be considered for low vision services if they have uncorrectable vision loss that impacts their ability to perform activities of daily living, or that impacts their safety and / or well-being,” and that, “The person should be fully informed at an early stage and involved in decision making about the need for low vision services,” should be included with this criterion. However, in this round, the majority (44%) of the panel were neutral with regard to “Uncorrectable visual acuity worse than 6/12 in the better eye, or equivalent visual field loss (or visual field loss worse than the private driver licence standard)” being included as an additional criterion. The majority of the experts (88%) agreed that the SmartSight model could be used as a referral pathway guideline in Australia. Given the strong endorsement of two out of three of the referral statements and neutrality on the other, it was decided not to conduct further rounds with this sample of participants.

DISCUSSION

The aim of this Delphi study was to establish consensus-based referral guidelines for low vision services in Australia. Initially, 90 statements were developed from eight open-ended questions, which were subsequently reduced and refined to a total of four statements, three of which achieved consensus in the final round. Results were strongly supportive of a holistic approach based on functional vision (vision loss that impacts activities of daily living, safety and / or wellbeing) and not just visual acuity or visual field criteria. The expert panel members in this study were neutral on the inclusion of a visual acuity / visual field criterion. Additionally, the panel endorsed the inclusion of a statement on fully informing patients at an early stage and involving them in decision making about the need for low vision services. There was also support for using or adapting the SmartSight model of low vision rehabilitation in Australia.

As with the SmartSight model,[18] the referral recommendations that emerged from this study incorporated elements of the impact of vision impairment on daily life, as well as clinical vision measures. Importantly, the statement on the impact of vision impairment from this study highlights safety and well-being issues, not only a person's ability to perform activities of daily living. However, unlike the SmartSight model, there was some ambivalence in this study about the need for any mention of a visual acuity criterion. Although more supportive in the early Delphi rounds, participants in this study became increasingly concerned that any reference to visual acuity and / or visual fields might negatively influence the referral of some patients who might benefit. Given that other key guidelines for referral and classification include visual acuity and / or visual fields,[17,22,40] and that a visual acuity and / or visual field criterion could be helpful to practitioners who do not have expertise in this area and would be reassured to know that their referrals are appropriate, it is recommended that this criterion be retained for now, secondary to the functional criterion. Furthermore, there are established, objective, gold standard clinical measures of vision, whereas there is no agreed gold standard measure of functional vision.[41,42]

The specific visual acuity criterion for low vision referral to come out of this study (worse than 6/12) is again consistent with other guidelines[17,22] and with the latest WHO classification of mild impairment,[40] but better than the previous WHO classification (worse than 6/18)[23] and health insurance definitions.[29] It is clear that low vision experts in this study considered that earlier referral is required, something also emphasised in the European guidelines.[22] Although a number of guidelines mention visual fields, many do not specify a criterion,[17] while others suggest quite substantial visual field loss (within 30 degrees of fixation) as the cut-off,[22] that is inconsistent with the visual acuity criterion specified (which tends to be better). In this study, it was considered important to also provide a specific visual field criterion and this was based on the Australian private driver license standard.[30] This was both consistent with the visual acuity criterion specified and well known to eye care practitioners.

The findings from this study also highlight the importance of involving patients in decisions about low vision referral. The benefits of shared decision making, and patients' involvement are widely reported in the literature,[43,44] suggesting that patient participation often results in improved rehabilitation of patients.[45] Patient-centred care leads to increased uptake of service, greater health literacy, improved self-care, increased satisfaction with services and improved patient-clinician relationships.[43] In addition, the importance of involving patients in decisions about their care is highlighted in professional guidelines. The Optometry Board of Australia, Code of Conduct for Optometrists[46] indicates that making decisions about health care should be a shared responsibility of the treating optometrist and the patient, that good care consists of recognising and respecting the rights of the patient to make their own decisions and that it is important to refer the patient to another practitioner when it is in the patient's best interest.

The three recommended statements to guide referral from this study are shown in *Figure 2*. The statements have broad application with regard to referral for low vision rehabilitation and do not provide guidance on a model of who should provide low vision care and when. In part, this was a reason for presenting the SmartSight model to participants in this study, as it does provide guidance on who should provide low vision care and at what level. At level one, practitioners are encouraged to identify

patients that may benefit from low vision rehabilitation services and to respond by providing information. At level two, practitioners are expected to accurately record the patient's refraction and visual acuity, prescribe vision aids and report to the general medical practitioner that the patient may experience medical issues such as depression and falls as a result of their vision loss. At level three, practitioners are expected to conduct a comprehensive assessment of physical and social wellbeing, provide large-print materials, prescribe prisms, low to higher power magnifiers, video magnifiers and examine contrast sensitivity as well as scotomas. The fourth level involves a multidisciplinary team that includes an orientation and mobility specialist, occupational therapist and social worker so that the low vision patient is trained to adapt to their environment and manage activities of daily living. Practitioners are encouraged to be involved at their level of scope of practice and/or refer. In Australia, there is little awareness of this specific model and there is potential for much greater emphasis and promotion of practitioner involvement in levels one to three. Adaptation of this model for the Australian context has been previously suggested,[12,47] and could incorporate the referral statements found in this study. The findings from this study could be incorporated into the first three levels of the model, which relate to identification of vision loss and subsequent referral to rehabilitation services.

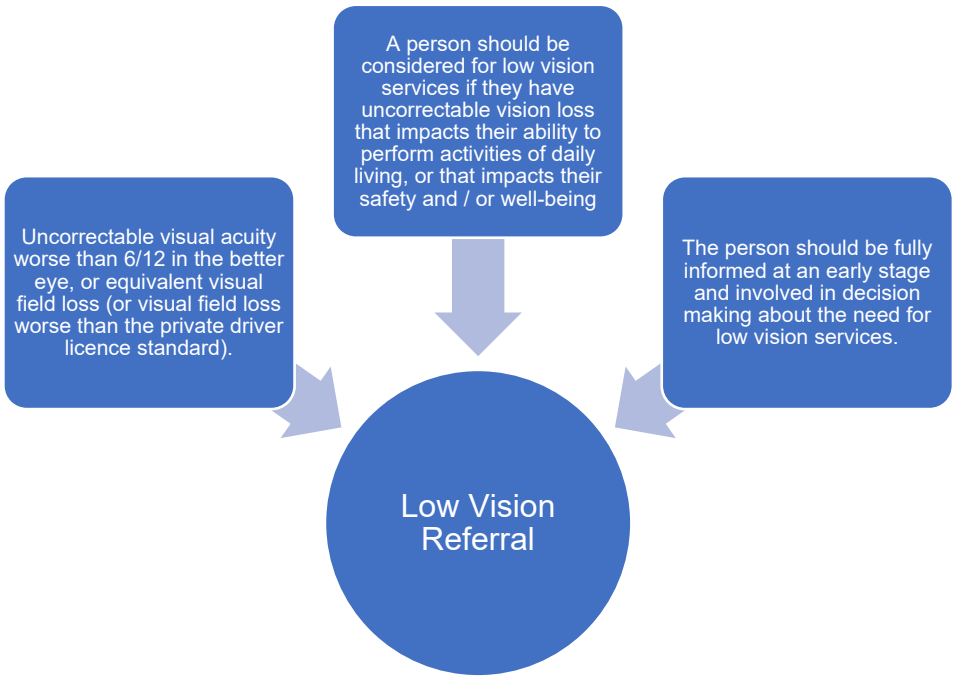

Figure 2. Recommended low vision referral criteria.

This study is one of the first to undertake a Delphi approach to establish consensus-based, clear low vision referral guidelines. However, there are some limitations. The Delphi method has been criticised for forcing consensus by not allowing experts to participate in open discussion.[37] Furthermore, there was some potential bias in the panel selection, as there are no standard qualifications or criteria for defining a 'low vision expert' in Australia. Although the views of the panel may not generalise to other 'experts' or to other countries where the epidemiology of vision impairment and the availability of low vision services is different, the methods used and some parts of the guidelines could be of use in a range of other countries. In addition, there was no attempt to force a decision about including or excluding a criterion based on clinical vision measures. It was decided that another round using the Delphi process would not necessarily be useful or achieve consensus on this matter. Other research methodologies should be used with a larger and broader sample of key stakeholders in future (including practitioners who may not have the time or expertise to obtain non-clinical criteria and importantly, patients) to provide the evidence for or against the addition of a clinical vision measure criterion. Also worthy of consideration is whether or not patient reported outcome measures,[48,49] could be used to support the assessment of daily visual functioning issues and determine cut-off criteria for referral. Finally, the usefulness of the guidelines developed in this study to clinical practice remains to be tested with both practitioners and patients. This will require promotion and awareness, as guidelines alone are unlikely to be effective. Future studies should investigate the translation of these suggested guidelines to practice and evaluate effectiveness in increasing timely referrals and uptake of referral.

CONCLUSION

In three Delphi rounds the panel of 38 experts produced three key recommendations for low vision referral. The primary recommendation was that referral should be based on the impact of vision impairment on function and wellbeing, with the panel being neutral with regard to the inclusion of a criterion based on clinical measures of visual acuity and visual field. However, at this time, it is suggested that a criterion

based on clinical measures should be retained and investigated in future studies. Fully informing a person about low vision services at an early stage of vision loss and involving them in decision making were also deemed important.

Additionally, there was consensus on the need for clear referral pathways and that both ophthalmologists and optometrists have primary responsibility to refer for low vision services. Finally, there was support for promoting a more formal tiered approach to low vision service provision and referral in Australia, such as the SmartSight model developed by the American Academy of Ophthalmology.

Although recommendations and guidelines should not replace sound individual clinical judgement, promotion and adoption of these consensus recommendations could assist health care professionals to provide appropriate and timely referral for low vision services to the benefit of people with vision impairment. These guidelines could be utilised by low vision service providers as well as private practitioners involved in the management of patients with vision loss.

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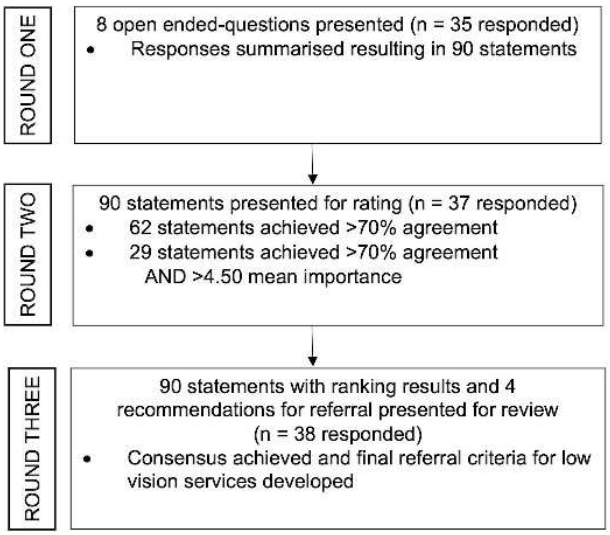

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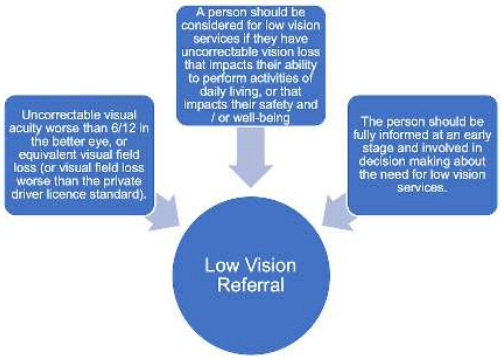

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