The Development of Entry Level Low Vision Rehabilitation Competencies in Optometric Education

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Abstract

The purpose of this study was to determine entry level vision rehabilitation competencies for graduating optometrists and to examine the level of agreement about those opinions using consensus methodology. A mixed methods consensus approach to define competencies in entry level low vision rehabilitation was used. The study extended 6 months, incorporating online surveys and a 2-day meeting. Twenty entry level low vision competencies were approved by the Association of Schools and Colleges of Optometry in 2009. A 2-level approach to the education and practice of low vision may be a solution to the call for trained doctors who can meet the growing need in the current low vision landscape.

Key Words: *Low vision rehabilitation, optometric education, competencies, consensus methods, entry level low vision.*

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Background

In 2004, the American Optometric Association approved a definition of vision rehabilitation as:

"The process of treatment and education that helps individuals who are visually disabled attain maximum function, a sense of well-being, a personally satisfying level of independence, and optimum quality of life. Function is maximized by evaluation, diagnosis, and treatment including, but not limited to, the prescription of optical, non-optical, electronic and/or other assistive treatment options. The rehabilitation process includes the development of an individual rehabilitation plan specifying clinical therapy and/or training in compensatory approaches."[1]

This definition is part of a comprehensive and complex rehabilitative medicine model that involves the creation of an individual rehabilitation plan for each patient based on a medical evaluation provided by the doctor and a plan of treatment provided by therapists.[2] Although some training in these procedures is provided in the schools and colleges of optometry, current curriculum hours and the training of the instructors limit the extent to which graduates can realistically be prepared to practice at this level.

A low vision curriculum model was proposed in 1982 by the Association of Schools and Colleges of Optometry (ASCO)[3] with recommendations for a significant increase in the number of faculty and hours of instruction. This plan proposed that optometry students be exposed to 30 hours of didactic lecture, 20 hours of laboratory time, and 120 hours of direct patient clinical experience in the area of rehabilitative optometry.

In 2008, a non-published survey of low vision educators at an ASCO low vision special interest group meeting revealed that all 19 of the schools and colleges of optometry in the United States, Canada, and Puerto Rico provided a curriculum in rehabilitative optometry.[4] However, the number of lecture (median 28 hours), laboratory (median 8 hours), and patient contact hours (median 49

hours) varied considerably from school to school. The content of the curricula at the schools was also varied and was often driven by the training of the individual instructors, national board examination content, and general accreditation criteria.[4] There were outliers in this survey in that five schools only offered low vision clinical exposure as an option to their students.

With the growing demand for expanded training consistent with the current, more comprehensive low vision rehabilitation model, there is concern that the curricula in the schools and colleges may not have the resources to produce the required highly skilled and knowledgeable low vision providers. Postgraduate educational opportunities for optometrists seeking greater expertise include 14 low vision residency programs. It is unlikely, however, that this number of residencies can support the necessary number of doctors who would be trained in the rehabilitation medicine model to meet the growing demand of patients with vision impairment. A dichotomy exists between the skills and experience required to implement a highly complex model of vision rehabilitation and the current and varied low vision optometric curriculum. A coordinated effort among the vision rehabilitation educators to reach consensus about the specific elements of vision rehabilitation curricula for entry level or comprehensive level care would seem warranted.

The definition of visual impairment established by the Centers for Medicare and Medicaid (CMS), requires a diagnosis of best corrected visual acuity of less than 20/60 or certain visual field defects for coding and billing of vision rehabilitation. There are, however, many patients who experience visual impairment and functional difficulties, yet have better than 20/60 visual acuity. This is important because the primary goal of low vision rehabilitation is to restore functional ability in patients with permanent vision loss.[5] By applying measured prevalence rates of visual impairment and blindness in the United States to 2000 census data, it is estimated that approximately 1.5 million Americans over the age of 45 have less than 20/60 visual acuity, and 240,000 new cases of visual impairment and blindness occur each year.[6] With the aging population, the number of people with visual impairment is expected to double over the next 25 years.[6] It is also estimated that another two million Americans have best corrected visual acuity in the better eye that is worse than 20/40 but better than 20/70.[6] These patients are classified with mild visual impairments that negatively impact their daily functioning, but they may not qualify for rehabilitation under the CMS guidelines for visual acuity. In a small pilot study of the potential of low vision clinical trial sites, six optometric low vision clinics recorded patient characteristics over a 30-day period.[7] This study showed that approximately 78% of all patients (n=163) who were considered "low vision" by the doctors met the ICD-9 classification for moderate visual impairment or better based on visual acuity of better than 20/200, and more specifically, 36% had acuity better than 20/70. These findings suggest a need to revise the current model to include a multi-tiered approach to low vision rehabilitation. All patients with visual impairment could be triaged and managed within the profession of optometry, using a well-defined, two-level approach to vision rehabilitation based on a patient's level of visual impairment. Clearly defined referral criteria and education of comprehensive vision rehabilitation services would be critical when more complex care is needed.

The concept of levels of low vision rehabilitation was introduced in general ophthalmology in the United States through the efforts of the Vision Rehabilitation Committee of the American Academy of Ophthalmology through the SmartSight initiative.[8] The first level in the initiative called on ophthalmologists to refer at 20/40 level of vision, provide a simplified model of care in the second level, and provide a complex rehabilitation model in the third level.[8] The International Council of Ophthalmology also supports three levels of training (competencies) or curriculum for low vision rehabilitation including basic, standard, and advanced level goals.[9] The goal of a two-tiered approach for optometry would be to have 100% of optometrists providing entry level low vision care (levels one and two in SmartSight) in-office and then referring for complex care.

In 2008, the Low Vision Intervention Treatment (LOVIT) trial recommended early intervention while patients are waiting for more complex treatment.[10] This suggests a high priority should be placed on preparing optometry graduates to provide early intervention in rehabilitating low vision patients. The definition of entry level or primary low vision care and the features of a suitable education to provide care at that level should be established, and serious effort should be exerted to ensure the adequate preparation of graduates. Optometric educators need to explore the feasibility of teaching entry level low vision rehabilitation for all graduating optometrists (i.e., primary vision rehabilitation care), which necessitates the defining of entry level competencies.

The Low Vision Educators Special Interest Group (SIG) was formed in 2006 through the Association of Schools and Colleges of Optometry (ASCO) and consists of representatives from every school and college of optometry in the United States, Canada, and Puerto Rico. The direction and goals of the SIG were determined through group discussions and polls during initial meetings held at the meeting site of the American Academy of Optometry. A common theme surfaced: The low vision curricula at the schools and colleges had not evolved to consistently address the educational competencies required for our graduates. There was concern that the depth and breadth of the classroom, laboratory, and clinical experiences were not adequately tailored to the needs of graduating optometrists. As a result, the SIG undertook an effort to define and develop specific entry level competencies for graduating optometry students, with the idea that such a document would have the potential to serve as a foundation for faculty in creating or maintaining the vision rehabilitation educational curricula in the schools and colleges of optometry. In particular, the group considered it unrealistic to provide graduates with the highest levels of competency in this complex field given the limitations of the standard 4-year optometric curriculum and the number of patient encounters that can be made available to interns. The low vision educators instead decided to develop a solid set of entry

level competencies, with the idea that they might later address more advanced levels of competency that might require postgraduate residency training.

Purpose

The purpose of this study was to determine entry level vision rehabilitation competencies for graduating optometrists and to examine the level of agreement about those opinions using consensus methodology. The specific questions addressed in this study include:

1) What are the most important competencies in the education of vision rehabilitation for the optometric graduate as determined by a steering committee of educators?
2) What are the opinions of the vision rehabilitation faculty at all schools and colleges of optometry regarding those competencies?
3) How do expert opinions change between rounds and influence the final level of agreement (consensus) regarding those competencies?
4) What are the opinions of the faculty (experts) with regard to the effectiveness of the methods used to gain consensus?

Methods

A mixed methods approach was used for the study, consisting of consensus methodology of quantitative estimates through qualitative approaches.[11] Such a hybrid process can be complicated in design and data analysis, but the steering committee chose this method with the intention of developing trust and dedication while exploring the opinions of optometric faculty at the ASCO institutions.

Consensus methodology

This study primarily utilizes the Delphi method but incorporates some aspects of the nominal group technique in a hybrid methodology with qualitative and quantitative design characteristics.

The Delphi method is designed to gain opinions from members of a group and work toward a consensus without the influence or time delay of extended discussions and personality interplay.[11,12] It is an iterative process that usually starts with presentation of background information on the topic in question and a period of idea generation. The ideas are organized by the investigators and formatted into a rating scale questionnaire where a group of experts are asked to rate and may also be asked to comment on each idea anonymously.[12] The investigators analyze the results of the ratings, inform each expert of the collective responses, and administer at least two more rounds of questionnaires until a list of ideas is formulated or consensus is achieved.

One of the criticisms of the Delphi method is that it forces consensus by not allowing experts to participate in open discussion.[11] In this study, a modification of the process that borrows from the nominal group technique (NGT) was utilized to allow for a deeper exploration of areas of disagreement or for clarification of comments.

The NGT also utilizes a panel of experts, but it is completed in person with a facilitator guiding the process. The experts silently generate ideas about the topic of inquiry, the ideas are listed for all to view and are discussed by the group. Then each expert selects and ranks the top ideas in order of priority. Group discussion is held after rankings are reviewed by the facilitator, and a second round of ranking is completed. The process may continue until a final endpoint is achieved.[12]

Participants

The ASCO Low Vision SIG steering committee members were the investigators in this study and also participated as experts in each round of the Delphi process. In later rounds, the primary educators of vision rehabilitation curriculum at each of the schools served as the Delphi experts. Twenty-two experts were invited to participate in round 2 online. At the time of the study, there were 16 schools and colleges of optometry in the United States and three member or affiliate schools in Puerto Rico and Canada. All low vision educators (appointed by respective deans as the contact person) were e-mailed the link to the initial Delphi survey. Reminders were sent weekly for several weeks to the educators who did not respond. In addition to the ASCO college representatives, one representative of an affiliated Veteran's Affairs (VA) low vision residency program was included. An in-person meeting included 14 experts at 13 schools and colleges and one VA externship site. Three other participants in the 2-day meeting, who did not act as Delphi experts but participated in group discussions, included the ASCO board representative and two vision rehabilitation faculty from the represented colleges.

Procedures

Initial items (competencies) were drafted by steering committee members through a compilation of background preparation, literature review, and curriculum review of the five schools represented by the committee members.

The Delphi method was employed through the use of an online survey site through round 2. Each item or tentative competency utilized Likert ratings with "0" representing "not important at all" and "10" representing "very important for minimum competency." Anonymous comments were also solicited for each item and a final item requested ideas for additional themes. Between each round, the steering committee revised items based on rating scores and comments gathered from the survey system. The mean for each item represented the level of priority of the item for inclusion as a competency (group opinion), and the standard deviation represented the level of agreement.

Rounds 3 and 4 were conducted at a stand-alone meeting in July 2008 to which all low vision educators (experts) were invited. A modified NGT was employed through the use of a group facilitator (the first author), small work groups, and large group discussion. The Delphi online survey system was used to gather opinions after the group discussions. One key deviation from the typical NGT process was that items were not ranked in priority but were individually rated by importance (scale of 1 to 10). Small working groups each revised four competencies and reported revisions to the whole group for discussions and final revisions. The group then rated items anonymously online. Round 4 included a review of means and standard deviations for each item and collectively; final revisions included language consistency and uniformity of competency structure. For a

summary of methods for each round, see Figure 1.

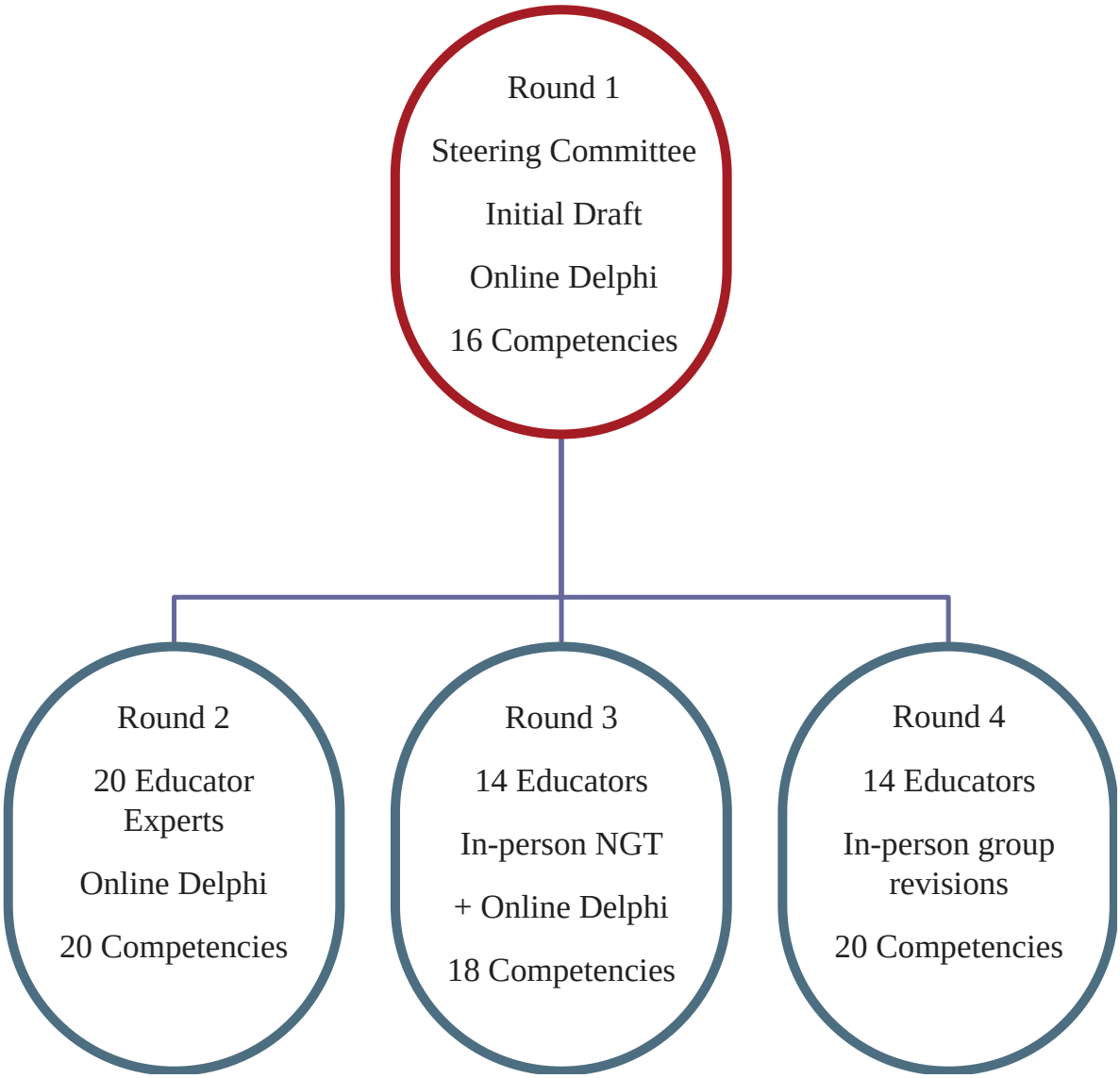
During the week following round 4 (in-person meeting), the experts completed a brief online survey about the overall effectiveness of the process, the competencies were reviewed by a few of the educators for minor editing for consistent terminology and were then sent to the American Optometric Association (AOA) Vision Rehabilitation Section Chair for comments. Minor comments and suggestions were gathered and integrated into the final document. The document was distributed by e-mail to all members of the Low Vision Rehabilitation Educators SIG for final comments and approval. The final competencies were then submitted to the executive committee of ASCO for official acceptance.

Results

Round 1

The mean was a measure of central tendency and, therefore, represented the level of agreement of the experts item by item. No criteria were predetermined for level of agreement; however, after evaluating the results of the initial survey, the group considered a score of 8 or above to indicate strong agreement that the item should remain as a competency. The standard deviations were also reviewed and

Figure 1:
Summary of methods by round



represented the spread or the amount of disagreement of the experts. The initial draft of 16 competencies from the steering committee is shown in Table 1. Four items were noted for extremely low scoring (<8, SD>1) and three items for extremely high scoring (9 or greater, <1.0 SD). All items were reviewed with comments to better understand any necessary deletions, revisions, or preservation.

The steering committee reviewed the poorly rated items to determine if some key points were salvageable rather than eliminate the entire concept. For example, if an item was not entry level, the issue was discussed by conference call to determine if there was a clear division of the topic into two levels, and then an item was drafted to capture the entry level idea. Items were more specifically defined, and redundancy was eliminated (e.g., items 1 and 2 from Table 1 developed into different items in 1 and 2 of Table 2), and more were added to the list (20 total competencies). New items included use of electronic magnification and knowledge of how to refer and sign a plan of care for occupational therapists.

Round 2

A revised list of 20 competencies was sent to 22 experts. Twenty experts (including the five steering committee members) responded to the online survey with 18 schools and colleges represented. Six items were noted for extremely low scoring (<8, SD>1), and three items for extremely high scoring

Table 1
Round 1 steering committee competency development.

	Competency	Mean	St Dev
1.	Understand and be sensitive to the psychological and emotional aspects of visual impairment and be able to describe challenges commonly encountered by individuals with visual impairments.	8	0.63
2.	Be sensitive to psychological and emotional aspects of visual impairment and be able to describe challenges commonly encountered by individuals with visual impairments.	8	0.89
3.	Be able to describe functional implications of various visual system pathologies and diseases.	8.2	0.75
4.	Be able to describe significant co-morbidities that impact low vision rehabilitation	7.8	1.17
5.	Be able to perform appropriate visual acuity testing at both distance and near for visually impaired patients.	9.8	0.4
6.	Be able to describe low vision assessment techniques (e.g., ETDRS, Bailey-Lovie, Feinbloom charts)	9.2	0.75
7.	Be able to examine the visually impaired patient: history, ocular inspection, refraction, visual acuity, reading assessment, fields, contrast sensitivity, and other vision functions.	8	1.79
8.	Be aware of various visual field tests and their purposes and be able to select appropriate visual field testing based on patient profile.	8.2	0.4
9.	Be able to assess eccentric viewing postures and skills, patient motivation, scanning ability (for patients with restricted fields).	6.4	1.36
10.	Be able to prescribe simple but appropriate rehabilitative therapies and optical devices to help the patient meet their goals. (e.g., magnification, illumination).	9.4	0.8
11.	Be able to describe various low vision aids and the optics of low vision devices.	7.4	1.36
12.	Demonstrate low vision devices and educate low vision patients on the uses and limitations of these devices for patients with low complexity vision loss (i.e. low powered hand and stand magnifiers, high reading addition lenses, low powered telescopes).	9	1.26
13.	Be able to describe visual field enhancing techniques for hemianopic field loss.	6.6	1.62
14.	Develop an understanding of the interdisciplinary approach to low vision rehabilitation, including the role of the O&M instructor, social worker, psychologist, educator, rehabilitation counselor, audiologist, occupational therapist, and ophthalmologist.	8.2	1.33
15.	Be able to evaluate visual acuity and visual field for determination of level of visual impairment for determination of legal blindness or disability.	9	1.26
16.	Understand the local licensing regulations and be able to assess a patient for vision requirements for those regulations and complete appropriate driving documentation when necessary.	8.4	1.5

(9 or greater, <1.0 SD). A scatterplot of the 20 items (Figure 2) shows the overall distribution of the opinions and the extent of the agreement through the means and standard deviations, respectively.

Round 3 (In-Person)

Following small group and corporate revision processes according to a modified NGT, 14 experts (including the five steering committee members) responded to the online survey, with 13 schools and colleges and one VA externship site represented. A scatterplot of the 18 items (Figure 3) demonstrates a stabilization of group opinion as seen by the clustering toward the right of the figure with high means (close to 10) and low standard deviations. Seventeen items had means above nine, and 16 items had standard deviations less than one. This indicated strong agreement and priority for the inclusion of the majority of the items.

Round 4 (In-Person)

Online anonymous ratings of items were presented to the full group on the last day of the in-person meeting. Through full group participation, most items were revised with minor changes, while several were subject to

Figure 2:
Round 2 Scatterplot of 20 items representing level of priority (means) and level of agreement (standard deviations)

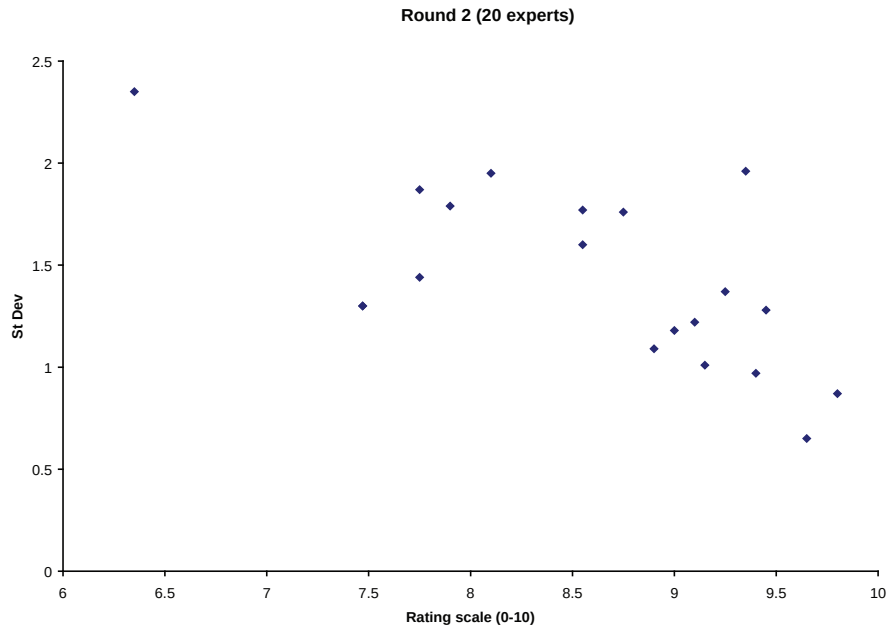
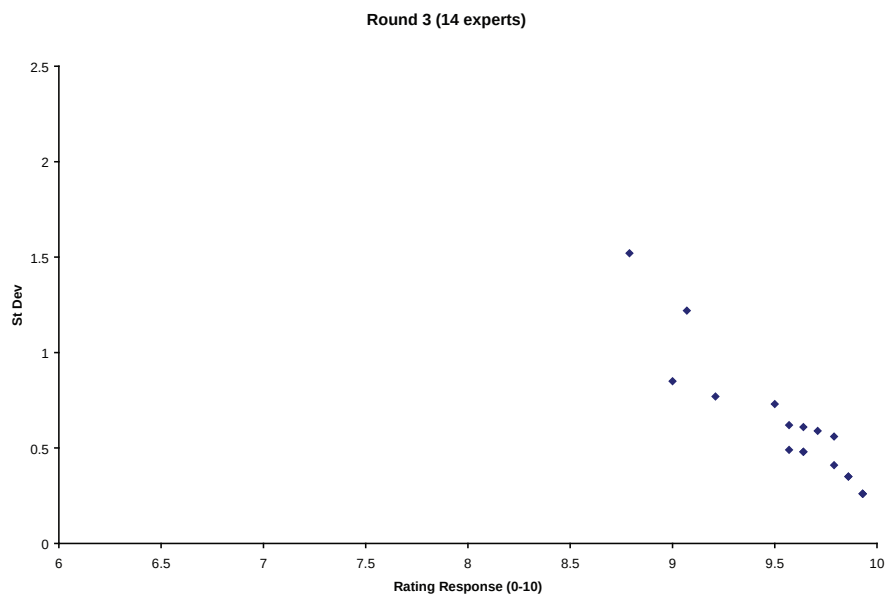


Figure 3:
Round 3 Scatterplot of 18 items representing level of priority (means) and level of agreement (standard deviations)



major group revision. Examples of major changes included items 1, 2, and 11 in Table 2. Item 11 addressed the concept of predicting magnification and understanding the optical principles of low vision devices. Two new items were added at the end of the consensus process regarding considerations for examining pediatric and special populations (final item 15) and about identifying agencies that can offer support and information to patients with visual impairment (item 19).

Final Follow-up

A few comments suggesting wording consistency were collected by e-mail within 2 weeks after the meeting. The list of final competencies was introduced to the AOA executive committee, and no major changes were recommended. The final list was submitted to the appropriate ASCO committee and ultimately to the board for approval. Official approval occurred in June 2009.

A final brief online survey was issued to all the experts prior to leaving the in-person meeting. The first question was: "How would you rate the effectiveness of this meeting overall?" The scale for rating extended from 0 (not effective) to 10 (extremely effective). All 14 experts responded. The mean was 9.5, and the standard deviation was 0.5, indicating a positive assessment of the meeting. One expert commented, "I felt that this meeting was highly effective and that we accomplished the stated objectives that had been set for the meeting. I am encouraged that we have laid the groundwork for the development of appropriate and effective standards for low vision education in all academic institutions and the momentum is definitely there to ensure that we will accomplish our objectives."

Another item asked: "How do you feel about the organization and structure of the meeting?" The scale extended from 0 (did not meet expectations) to 10 (exceeded expectations). Again, the mean was 9.5, and the standard deviation 0.5. Most experts thought the meeting was efficient and well-organized. One statement expressed the collective thought: "Very well organized overall. …Liked the interaction and collaboration aspects of the discussions ... no one

Table 2
Round 4 Final competencies

1.	Be able to apply epidemiologic aspects of visual impairment, appropriate terminology and classifications of visual impairment in order to communicate with patients, the public and other health care providers.
2.	In addition to performing a standard case history, be able to ask basic questions about symptoms, functional difficulties, and rehabilitation goals to anticipate the level of care that patients with visual impairment may require.
3.	Be able to recognize functional implications, hereditary factors and prognoses of common causes of visual impairment and explain them in language understandable to patients, families and other care providers.
4.	Be able to recognize psychological factors (e.g. depression, grief, motivation) that may affect adjustment to vision loss and the potential for rehabilitation.
5.	Be able to recognize pertinent social factors (e.g. social support system, education level, vocation, physical environment) and how they may influence the rehabilitation plan and process.
6.	Be able to recognize significant physical and neurological co-morbidities (e.g. Parkinson disease, stroke, dementia) that influence low vision rehabilitation and modify evaluation strategies and rehabilitation.
7.	Be able to perform visual acuity testing at both distance and near on patients with visual impairment using appropriate charts with proper documentation (e.g. working distance, eccentric viewing, illumination).
8.	Be able to perform trial lens refraction and modify refractive techniques for the patient with visual impairment (e.g. bracketing, hand held Jackson cross cylinder).
9.	Be able to recognize common symptoms of contrast sensitivity loss, screen for loss, recommend basic modifications (e.g. filter, lens, lighting and environmental options) and refer for comprehensive low vision rehabilitation when indicated.
10.	Be able to detect scotomas of the central visual field, understand their impact on visual acuity and visual function, and educate patients about their implications for activities of daily living.
11.	Understand basic optical principles of low vision rehabilitation devices and be able to predict magnification levels needed to achieve patient goals.
12.	Be able to prescribe basic optical and non-optical low vision rehabilitation devices, provide training in their use, and refer for comprehensive low vision rehabilitation when indicated.
13.	Be able to recognize availability of and indications for use of adaptive technology (e.g. video magnification, software) and refer for comprehensive low vision rehabilitation when indicated.
14.	Be cognizant of rehabilitation strategies for visual field deficits (e.g. sighted guide technique, orientation and mobility, visual field enhancement devices and equipment, scanning training) and refer for comprehensive low vision rehabilitation when indicated.
15.	Develop an understanding of the special considerations for examining children, the elderly, and the multiply handicapped and educate about referral options and potential for rehabilitation.
16.	Understand relevant vision standards for driving, provide necessary assessment and documentation, and refer for comprehensive low vision rehabilitation, driver evaluation/training, and medical evaluation when indicated.
17.	Be aware of the criteria for legal blindness determination and be able to educate patients on the basic social and legal ramifications of legal blindness certification.
18.	Understand that the needs of patients with visual impairment may require professional collaboration and be able to coordinate care with available rehabilitative, educational and social service resources.
19.	Identify governmental, private and consumer organizations that offer support and information to individuals with visual impairment (e.g. NEI, Veterans Administration, state rehabilitation agencies, foundations for the blind, consumer advocacy groups and support groups).
20.	Be familiar with third party reimbursement for low vision rehabilitation services and materials.

person "taking over"... actually finished a major task w/many leaders in one room ... enjoyable group!" The other items in the final survey asked open-ended questions about the future actions of the groups and about how they would make changes at their schools in response to the meeting. The responses may be explored in a future paper.

Discussion

In summary, data were collected for four rounds over 6 months through online survey administration in quantitative and qualitative format. In-person small groups and corporate discussion also accomplished opinion-gathering and formation of tangible competencies. The expert opinion changed between rounds, with the final round gaining consensus for all items, with the majority of the mean ratings in the nine or above range and less than one on standard deviations. Overall, the experts were pleased with the organization and structure of the process and commented on the efficiency of the process due to the amount of work completed through the rounds of the consensus methods.

From start to finish, the development of the final draft of competencies maintained some key elements, but invaluable discussion occurred regarding several concepts, such as field enhancement, driving standards, comprehensive rehabilitation models, and depth of teaching and terminology for optical principles.

Both the quantitative analysis using descriptive statistics and the qualitative analysis of comments were useful for converging on consensus. Comments from the online survey process were gathered between rounds and provided the context for the statistical performance of the items. The comments could be grouped into themes of recommendations for revisions: 1) Statements that the competency was not entry level (i.e., should belong to comprehensive low vision rehabilitation); 2) The competency was too broadly stated; or 3) The item was redundant from another stated competency. The general agreement for the importance of a category or theme was obvious from the comments, which helped determine if a competency needed to be eliminated vs. dramatically revised. The specific choice of wording was usually the basis for disagreement with the majority of the competencies early in the process.

Eight items were similar in content from the first round. Between-round comparison is shown in Figures 4 and 5. Figure 4 demonstrates the changes from round 1 through round 3, showing the changes in group opinion for first round items 3, 4, 5, and 12. Visual acuity testing appeared to have high consensus throughout the rounds, although the specific choice of words changed significantly throughout the rounds. The competency related to comorbidities (item 4 in round 1) started as a weaker scoring item and lost some agreement in round 2, but in round 3, the revisions were significant enough to maintain the concept as a final competency (Table 2, item 4).

Figure 5 demonstrates similar changes in the other four items from round 1 (13-16). The ratings for item 13, field enhancement, changed dramatically and reached final consensus that entry level would necessitate that the graduate be cognizant of techniques, devices, and when to refer (Table 2, item 14). Two of the items regarding issues related to driving and legal blindness determination were debated relative to international standards (one school from Canada was represented), and revisions included generic language while maintaining the core competency.

Figure 4:
Changes in group opinion from round 1 through round 3 for first round items 3, 4, 5, and 12.

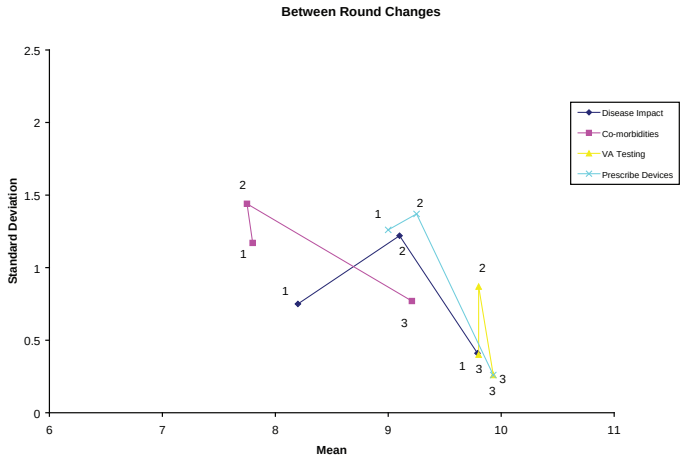
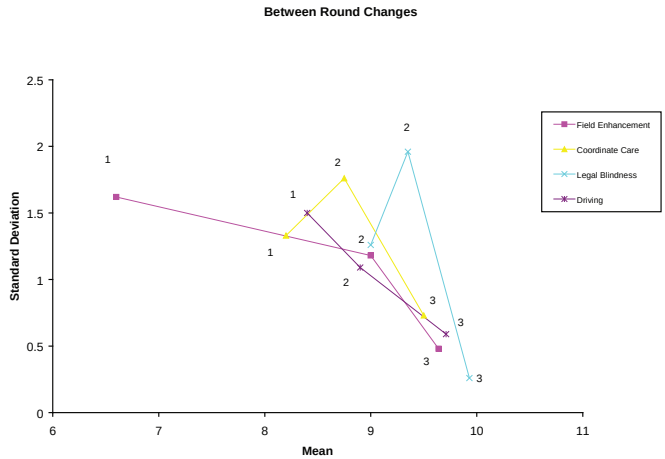


Figure 5:
Changes in group opinion from round 1 through round 3 for first round items 13-16.



Limitations of the expert decision-making process should be considered, because they could affect the stability or reliability of the final consensus decision. Two possible processes could have occurred during this study. The *halo effect* is when an expert changes opinion radically throughout the rounds, seemingly to conform to the group opinion. Conversely, the expert who never budges on opinion may be damaging to the final result, as well. The Delphi process does not typically include a comment phase or an open discussion phase to explain why experts vote the way they do. Therefore, with the hybrid design of an open meeting to discuss issues, all opinions were sought in a friendly environment by the facilitator, and group consensus did seem to be achieved with all extreme opinions explored.

Expert dropout is another area of concern. In this study, dropout did occur due to the modified nature of holding an in-person meeting rather than following all rounds online with the original experts. While all of the experts in the later rounds were involved in the original online voting process of round 2, the group discussion aspect was valued more than the traditional Delphi anonymous methods.

Educational Policy

The comprehensive low vision rehabilitation curriculum recommendation in 1982 offered extensive recommendations for specific instructional hours and faculty resources. The high level of curricular commitment this would have required may have led to its incomplete adoption.[3]

The development of a well-defined set of entry level competencies in vision rehabilitation care reported here may allow for schools and colleges to evaluate their programs individually and to determine what curriculum adjustments may be warranted to best meet the needs of graduating optometrists at their particular institution. Additionally, these entry level competencies may have implications at the national level in the context of AOA policies and in the consideration of specialties within optometry as an outgrowth of the recent development of board certification procedures for optometrists.

Practice Implications

Since the consensus process in 2008, the vision rehabilitation educators have met twice, and the outcome has been the creation of objectives for each of the competencies. The purpose of writing the objectives was to provide measurable guidelines for the educators to more easily integrate the competencies into their curricula. Future work at educator meetings will include sharing and brainstorming ideas for teaching strategies of each of the competencies. It would also be helpful to create a study that measures the level of implementation of the competencies accomplished by the educators over time. Another large project for the educators is the development of advanced competencies for comprehensive low vision rehabilitation. Studies should also be performed to test the effectiveness of primary low vision care on patients with early stages of vision loss.

Some optometric educators have been concerned that too often low vision rehabilitation has been taught as an option to be practiced by only a few and that to practice well requires residency training or equivalent clinical experience not typically available to optometry students. With a lack of clear direction in their work, some low vision rehabilitation educators may have been left to focus on simply offering inspiration, training the most interested, or dispensing large quantities of unfocused information to entire classes.

The number of students who pursue further training or practice comprehensive rehabilitation is estimated by the Low Vision Educators SIG as less than 10% per class year. With approximately 1400 optometry graduates in the United States per year, 140 doctors interested in vision rehabilitation would not seem sufficient to change practice patterns significantly. In a recent investigation of low vision practice patterns, Owsley initially identified 1228 low vision service entities in the United States (any type of provider).[10] Of the 608 entities responding to the census survey, 79.6% or 484 had an optometrist providing some or all of the services. If the proportions hold true to the remaining entities that did not respond to the survey, an estimated 1000 optometrists are providing low vision services. This number is consistent with the number of AOA low vision members, although this does not account for optometrists who are not AOA members.

Another limiting factor is the distribution of low vision rehabilitation services nationally. Owsley and colleagues reported a low density of service providers on a population basis in the southern United States.[10]

Current practice patterns and understandings of patients' needs suggest that 1000 optometrists cannot adequately meet the demands of the estimated 1.5 million people with impaired vision, much less the additional 2 million who have mild vision loss. The Low Vision Educators SIG aspires to have all graduating optometrists meet competencies in entry level low vision rehabilitation or primary low vision care, with the potential that 1000 or so new and fully equipped optometrists would become available to serve the public each year.

To further facilitate the increased provision of low vision rehabilitation, research is needed to establish more clearly the most efficacious and cost-effective models of vision rehabilitation for private outpatient vision rehabilitation.[14] With the development and utilization of entry level competencies, graduating optometrists should be familiar with the concept of two levels of care, especially since many of the competencies contain a directive to refer for comprehensive vision rehabilitation. In this way, the competency structure itself encourages students and educators to consider advanced rehabilitation. Not only are expectations set for the care of patients with early vision loss, but expectations are created for referrals to colleagues who practice comprehensive rehabilitation.

Overall, this project has utilized novel techniques to allow optometric educators to define competencies in entry level low vision rehabilitation or primary low vision care that may have substantial implications for the education and practice patterns of optometrists in serving the needs of people with impaired vision.

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