

Referral Patterns in Low Vision: A Survey of Mid-South Tri-State Eye Care Providers

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Abstract

Background: As more people are living longer with the help of medicine and technology, a greater number have ocular disease that can cause progressive vision loss. Low vision rehabilitation services exist to evaluate these patients and prescribe low vision devices to maximize remaining vision. Despite the number of potential patients, there are fewer referrals to low vision rehabilitation services than one might predict. This study attempted to determine the impetus of, and referral criteria used by, various eye care professionals to refer for low vision rehabilitative services. Once barriers to referral are determined, this information can be used to develop educational materials that can be presented and distributed to eye care providers.

Methods: A multiple-choice survey questionnaire was sent randomly to 101 ophthalmologists and 180 optometrists who practice within 100 miles of Southern College of Optometry, in Memphis, Tennessee.

Results: The survey was completed by 14 ophthalmologists (13.9%) and 69 optometrists (38.3%). Of those who responded, 64% of ophthalmologists and 36% of optometrists considered referral for low vision services at visual acuity of 20/100 or worse. In contrast, 14% of ophthalmologists and 26% of optometrists considered referral for low vision services at visual acuity of 20/60. Of all respondents, 75% stated the primary reason for referral was difficulty with activities of daily living.

Conclusions: By waiting until severe vision loss has occurred before considering referral, eye care providers are allowing patients to reach significant functional impairment before receiving rehabilitation services. A paradigm shift needs to occur in which patients' functional needs are prioritized above their measured visual acuities in order to maximize effective patient care, including low vision rehabilitation.

Key Words

barriers to referral, low vision, quality of life, referral patterns, vision impairment, vision rehabilitation

According to the American Optometric Association (AOA),¹ one in four Americans aged 40 or older experiences some level of vision impairment. The most common causes of vision loss, including macular degeneration, glaucoma, and diabetic retinopathy, are age-related. With the trends toward increased life expectancy and body-mass index, there is more potential for vision impairment than ever before, despite advances in medical and technological management of ocular disease.

Low vision rehabilitation services (LVRS) exist to evaluate these patients and to prescribe low vision devices to maximize remaining vision. The goal is to improve quality of life. Optometrists specializing in low vision care are often the gatekeepers to state and private agencies offering support services to patients with low vision. (Table 1)

Low vision services, including prescription of optical and non-optical devices, have been demonstrated to be an effective means of enabling patients to have increased independence and quality of life and fewer difficulties with activities of daily living.²⁻⁶

Leat et al. showed that 90% of patients attending a low vision clinic perceived a benefit from the experience. This was strongly associated with a newfound ability to perform activities of daily living.² Patients who, with the aid of low vision

devices, could read size 2M print felt the greatest perceived benefit. Margrain illustrated the effectiveness of low vision aids as pertaining to reading. Upon new referral for a low vision evaluation, only 23% of patients could read standard newsprint. That percentage climbed to 88% with the use of a low vision device.³ Lamoreux et al. demonstrated improvements in patients' quality of life after receiving LVRS, using the Impact of Vision Impairment instrument. Specifically, the reading, accessing information, and emotional well-being subcomponents were positively impacted.⁴ Patients who receive multi-disciplinary vision rehabilitation are better able to use their functional vision, are less dependent on others, and have less difficulty performing activities of daily living.⁵ The LOVIT study by Stelmack et al., a randomized clinical trial, demonstrated that after receiving outpatient low vision rehabilitation services, the treatment group showed significant improvement in reading ability, visual mobility, visual information processing, visual motor skills, and overall visual ability as compared to the control group.⁶

Referring a patient to LVRS is the first step in demonstrating to a patient that something can be done to help him or her regain function and independence. Patients who present for a low vision consultation are usually referred by either an optometrist or an ophthalmologist. Despite the number of

Table 1. Support services for the visually impaired

Service	Description
Orientation and Mobility	Teaches a blind or visually impaired person how to travel safely and effectively either alone (cane training, with a guide dog, trailing method) or with someone else (guide techniques)
Activities of Daily Living (ADL) training	How to adapt everyday tasks such as: Kitchen skills and safety Cleaning and household tasks Finance and medication management Communication and Recreation Grooming and personal hygiene
Vocation Rehabilitation	Providing training for those seeking employment in adaptive environments
Assistive Technology	Equipment or software to assist the visually impaired individual in vocational or personal tasks
Counseling Services	Professional guidance to help individuals overcome adjustment or obstacles, can be individual or group
Library Services	Provide Braille, audio and special format books and magazines
Transportation Services	Supplementary transit without fixed schedules or routes serving those with various disabilities, including visual impairment

possible patients, there are fewer referrals to LVRS than one might predict.

There is a small body of research which discusses barriers to low vision services.⁷⁻¹⁴ A recent survey of ophthalmologists by the Canadian National Institute for the Blind (CNIB) determined that key barriers to referral included misconceptions regarding referral criteria and lack of information regarding CNIB services. The responding doctors stated that the main reason for referral to CNIB was difficulty with activities of daily living, yet referral criteria for most respondents was at the level of legal blindness. In terms of visual acuity, 62% of doctors made a referral once the visual acuity reached the level of 20/200 or worse. If visual field loss was present, 76% considered referral when peripheral visual field loss existed, with most specifying 10° or less of remaining visual field.⁷

Owsley et al. surveyed providers and agencies and characterized LVRS, providers, and the clientele using these services, giving a picture of what is available to meet the growing need for LVRS.⁸ Of particular note is that all services are not universally offered, density of services is variable across the country, and that 40% of entities providing LVRS have only one low vision professional on staff. The majority of providers (42.7%) are optometrists in private practice who see the fewest number (4.1) of low vision patients per week. The next largest group of providers, ophthalmologists in private practice, sees 5.1 patients per week. These doctors are providing basic LVRS including determination of rehabilitation goals, fitting and dispensing of optical aids, and basic training. It was reported that nearly 90% of providers report external referral for services not offered by the office.

An Australian study in which optometrists were surveyed regarding barriers to low vision care reported that many low vision patients were not being referred for LVRS until their level of visual impairment significantly affected their ability to carry out activities of daily living. Also striking was the de-

termination that optometrists referred patients with low vision to ophthalmologists for evaluation and treatment of ocular disease, with the expectation that the ophthalmologist would refer for low vision services. This frequently ended up not being the case.⁹

Two American studies focused on referral from ophthalmologists for LVRS. Greenblatt looked at the role of the ophthalmologist in the care of the visually impaired patient. Less than one-fifth of respondents discussed the diagnosis and prognosis with patients who were in the early stages of progressive vision loss (less than 20/70), or referred those patients for rehabilitation services. A similar pattern emerged for patients with moderate vision loss (between 20/70 and 20/200). For those with severe vision loss (less than 20/200 or less than 20 degrees of visual field), diagnosis and prognosis were always discussed and over half were referred to low vision services. Patients who experience vision loss but do not know that something can be done to help them may become lost to follow up before reaching the point of legal blindness, at which point, referral is much more likely to occur. This survey concluded that ophthalmologists' knowledge of available services was incomplete.¹⁰

Pankow and Luchins reviewed the records of patients at a Chicago area senior health center.¹¹ Although 47 out of 307 patients were deemed eligible for LVRS, only 13 were actually referred. Only one was referred by an ophthalmologist while the remainders were referred by geriatricians, social workers, and psychiatrists, all who had seen a presentation by a low vision optometrist. Keep in mind that all of these professionals including the ophthalmologist provided care in the same building that offered LVRS.

Methods

A multiple-choice survey questionnaire was sent to a random sample of eye care providers practicing within 100 miles of the Southern College of Optometry (SCO), located in Memphis, Tennessee. A computer-generated, geographically weighted random sample of 281 total eye care providers was created. This random sample included 101 ophthalmologists and 180 optometrists. The surveys were mailed to all doctors, and included a business reply envelope. With the assistance of Information Services at SCO, a website was set up so that providers could respond over the internet as an alternative to mailing back the survey. In an effort to save paper, SCO faculty members who were part of the random sample received survey documents as attachments via electronic mail. All responses were anonymous. No envelopes or survey documents were marked. The website blocked respondents' identifying information. Surveys were accepted for four months after they were mailed out to providers.

The 12-question survey was inspired by that of Adam and Pickering⁷ and included questions requesting: demographic information, referral patterns and criteria, data on potential low vision patients seen by each provider, inclusion of functional questions and functional testing in his or her examination sequence, and possible reasons for lack of referral. (Appendix A)

Results

Of those surveyed, 14 out of 101 (13.9%) ophthalmologists and 67 out of 180 (37.2%) optometrists responded. Seven surveys were returned to sender due to incorrect or outdated

Table 2. Breakdown of years in practice of survey responders by profession

Years in Practice	MD	OD
1-5	4	5
6-10	3	5
11-15	3	17
16-20	2	4
20+	2	35
No answer	0	1

Table 3a. Practice specialty for responding ophthalmologists

Specialty	Number (MD)
General Ocular Disease	4
Primary Care	4
Retina	3
Anterior Segment	2
Pediatrics	1

Table 3b. Practice specialty for responding optometrists

Specialty	Number (OD)
Primary Care	37
Ocular Disease *	5
Contact Lens	4
Pediatrics and/or Vision Therapy	4
Other (wrote in non-listed choice)	1
Combination +	16

* Ocular disease category includes providers who selected retina, anterior segment, glaucoma, or general ocular disease as their specialty

+ Combination category indicates providers who selected more than one specialty

mailing information. The adjusted total of 274 possible responses was used for statistical analysis. Response rate then becomes 81 out of a possible 274, or 29.56%.

A number of general demographic trends can be observed from this preliminary data. Most ophthalmologists who responded to the survey were in practice fifteen years or less, while most optometrists who responded were in practice fifteen years or more. In terms of practice setting, private practice had the largest percentage of respondents in each category. (Table 2) When asked to choose a specialty, most ophthalmologists and optometrists identified themselves as generalists or primary care providers. (Table 3a and 3b)

Over 90% of responding ophthalmologists and optometrists had previously referred patients to LVRS. (Table 4a) The main stated reason for referral was difficulty with activities of daily living, given by 78.6% of ophthalmologists and 74.6% of optometrists. (Table 4b)

A majority of ophthalmologists (64.3%) referred at visual acuity of 20/100 or worse. The distribution of referrals made by optometrists formed a bimodal curve. One peak was ob-

Table 4a. Previous referral to LVRS

Referral?	MD	OD
Yes	13	63
No	1	4

Table 4b. Primary reason for referral to LVRS

Primary Reason	MD	OD
Difficulty with ADL	11	50
Measure VA Loss	0	10
Presence of Ocular Disease	3	6
No answer	0	1

served when patients reached 20/50 acuity and the other peak was observed at acuity of 20/100. (Figure 1) In terms of visual field loss, more than 50% of clinicians in each category felt that central, peripheral, and hemianopic field loss were considered necessary to warrant referral. (Figure 2)

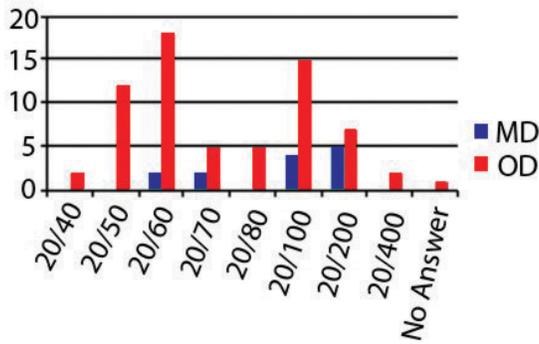
When questioned if functional issues such as difficulty with glare, reading, driving, seeing the television, mobility, and dry eye symptoms were addressed during case history, 50% of ophthalmologists and 41% of optometrists reported asking about all listed options. Over 40% reported that two or more options were asked routinely. The functional questions least asked by ophthalmologists were regarding dry eye symptoms and mobility. Optometrists were least likely to ask about mobility.

The practitioners were asked if they prescribed a +3.00 add or higher, performed contrast sensitivity/Amsler grid testing, or evaluated patients for magnifiers or telescopes. The most popular choices for both ophthalmologists and optometrists were prescribing a +3.00 add or higher and performing Amsler grid. Approximately four out of five ophthalmologists (78.6%) and optometrists (80.6%) listed one or both of these choices. Additionally, 25% of optometrists evaluated patients for magnifiers. Only two out of 14 responding ophthalmologists (14%) and four out of 67 responding optometrists (6%) reported testing contrast sensitivity, making it the least chosen option.

As for the final question regarding what factors prevented more frequent referral to LVRS, a majority of respondents did not answer the question. This included 78.6% of ophthalmologists and 35.8% of optometrists. As for the ophthalmologists who did respond to question 12, 14.3% were reportedly unaware of where patients can receive LVRS and 7.14% reported that they do not encounter patients who need LVRS more than once per year. For optometrists, 32.8% reported that they do not encounter patients who need LVRS more than once per year, and 16.4% felt they were well-qualified to offer those services themselves.

Despite the majority of respondents not choosing one of five listed options for the final survey question, some survey respondents included comments at the end of the survey which spoke to reasons why referrals were not made more often. Six doctors mentioned transportation difficulties on the part of the patient in terms of getting to LVRS providers, such as being in a rural area or that the local center closed. Additionally, six doctors mentioned financial difficulties on the part of the

Figure 1. Referral criteria-BCVA considered necessary to warrant referral to LVRS



patient, such as fixed or restricted income and the fact that low vision devices are not currently covered by most major medical or vision insurance plans.

Discussion

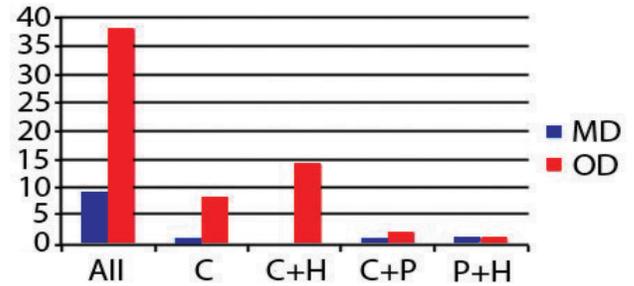
Previous studies have identified barriers to low vision referral on both the part of the patient and the doctor.⁷⁻¹⁴ The patient may feel that impaired vision is simply part of getting older. There is a lack of knowledge that services exist; some patients are unable to access existing services. There is still a stigma associated with being blind. Among doctors, it has been shown that there is a lack of knowledge regarding available services,^{10,12,13} a lack of training in rehabilitation,^{10,13} and differences in referral criteria.^{6,7,9,10,14} There are still some who have the outdated and mistaken belief that “nothing can be done” for patients with visual impairments. This survey attempted to assess barriers to referral on the part of eye care providers. A major limitation of this study was the small sample size as well as marked differences for sample size of optometrists and ophthalmologists. For that reason, it is only possible to note general trends and make recommendations based on those general trends.

Doctors who participated in this study identified the major reason for referring patients to LVRS as difficulties with activities of daily living. However, when examining the reported referral criteria, it is revealed that patients often experience significant difficulties with activities of daily living before referral to LVRS is made.

At levels considered mild to moderate visual acuity loss, patients are already having difficulty with everyday tasks. At 20/50, a patient cannot read standard newsprint.¹⁵ At 20/70, a patient will have difficulty recognizing faces, seeing the television, or writing a check.¹⁶⁻¹⁷ For these reasons, the whole clinical picture, including contrast sensitivity, glare, visual field loss, and mobility, is important when considering a referral for LVRS.

With low vision patients, contrast sensitivity testing is used to evaluate a patient’s visual functioning, and reveals information that cannot be obtained by testing visual acuity alone.¹⁸⁻²⁰ Objects in the real world are a variety of sizes and contrast levels. Contrast sensitivity testing has been shown to reveal visual difficulties earlier than visual acuity¹⁹ and is more relevant to performance of everyday tasks such as reading,²¹⁻²⁴ mobility,^{20, 25-28} driving,²⁹ and recognizing faces.^{30,31} This survey showed that a small number of providers are testing contrast sensitivity. In a previous survey of optometrists in the United King-

Figure 2. Referral criteria-Visual field loss considered necessary to warrant referral to LVRS (C=central, P=peripheral, H=hemianopic)



dom, Latham found that only 16% of respondents reported that they ever test contrast sensitivity.³²

In Latham’s study, lack of available equipment was the primary reason given for not assessing contrast sensitivity. Previous research has shown that the Mars and Pelli-Robson, two widely available contrast sensitivity tests, have been shown to be reliable.^{18,33-36} These tests are relatively inexpensive, quick to perform, and could even be administered by ophthalmic support staff members.¹⁹

A concerning result of this study is that the majority of optometrists and ophthalmologists are not questioning patients regarding difficulty with mobility. Visual field has been shown to be an important predictor of when safe travel will be compromised.³⁷⁻⁴² Patients meet the criteria for legal blindness when the visual field is 10 degrees or less, and no greater than 20 degrees at its widest diameter. Once patients have severely constricted visual fields, they already have significant mobility problems.

Lovie-Kitchin et al. offer criteria for mobility rehabilitation referral based on the extent of the visual field.⁴³ The authors determined that the potential for difficulty with mobility begins when the visual field is less than 70 degrees in diameter. Referral for mobility rehabilitation may be necessary when the visual field is between 31 and 52 degrees in diameter, and patients should receive orientation and mobility training before the visual field is constricted to 15 degrees in diameter. A referral for mobility evaluation and rehabilitation is recommended when patients are at risk for impaired mobility rather than when mobility is already considerably impaired.

Though this survey aimed to identify barriers to referral for LVRS, the data from this survey provides little help in identifying barriers because the final survey question, which specifically asked for reasons for infrequent referral to LVRS, went mainly unanswered. The question could have been worded differently. Additional answer choices, such as “I refer more than twice per year,” “I don’t agree with any listed option,” or the option for the respondent to write their own answer, could have been included. With the current results, it is not possible to determine who did not answer because referral is made more than twice per year versus who simply chose not to answer. Question 12 would benefit from revision in future uses of this survey so that this determination can be made.

While barriers to referral for LVRS were not able to be identified through this survey, question nine succeeded in gathering data on the number of patients with eye conditions with the

potential to cause vision impairment that are being seen by the responding eye care providers. Survey results from ophthalmologists show inconsistencies in reasons for non-referral, as the results of question nine were not consistent with the results from question 12. Though the sample size for ophthalmologists was small, a review of responses for question nine shows that 50% of ophthalmologists saw 10 or more patients with diabetic retinopathy per week. Additionally, 57% were seeing 10 or more patients with age-related macular degeneration and 64% were seeing 10 or more patients with glaucoma per week. The answer choice "I do not encounter patients who need these services (LVRS) more than once per year" does not seem to corroborate previous answers from any of the responding ophthalmologists.

Review of responses to question nine from responding optometrists shows a different picture altogether, as the majority report that they see far fewer patients with age-related eye disease. The number of optometrists that saw 10 or more patients with diabetic retinopathy per week is 24%, and only 22% saw 10 or more patients with age-related macular degeneration or glaucoma.

Question nine would also benefit from revision in future uses of this survey. Questioning providers as to how many patients are seen per week who have eye conditions with the potential to cause vision impairment is not as useful as knowing which of these patients have mild disease as opposed to severe disease.

Six doctors mentioned transportation difficulties on the part of their patients as a barrier to receiving LVRS. It is important to identify regions that are underserved so that efforts can be put in place to create change. Future research should focus on whether this is a widespread barrier to patients receiving LVRS and determine possible solutions. Owsley specifically mentions that the southeastern United States has a low density of service providers and agencies.⁸

Six doctors mentioned financial difficulties on the part of the patient such as fixed or restricted income and the fact that low vision devices are not currently covered by most major medical or vision insurance plans as another barrier to receiving LVRS. This was the topic of a recent publication by Morse et al.⁴⁴ Medicare's current policy classifies all lenses as eyeglasses and therefore denies coverage for all vision assistive equipment which contain lenses. No discrimination is currently made between lenses which are prescribed to correct for refractive error and lenses which are prescribed for purposes of magnification. The authors argue that this policy is discriminatory and advocate revision, stating that Medicare beneficiaries with other disabilities receive coverage for assistive equipment to help them to compensate for those disabilities, and that visually impaired Medicare beneficiaries deserve equivalent treatment.

Though lack of insurance coverage for low vision devices remains a reality, it is possible that many eye care providers may not be aware of financial assistance options for device purchase. Patients may be eligible to receive services and/or devices from state agencies for the blind and visually impaired. Colleges of optometry across the country offer financial assistance, through a variety of programs, which includes one or more of the following options: fee reduction or fees on a sliding scale (both based on income), private grants, donor funds, and affiliation with associations such as Lions Club

International. Eye care providers should not withhold referral to LVRS because of assumptions regarding ability to pay, but should make the referral and allow the patient to see what options are available in terms of recommended devices and financial assistance.

The number of doctors who reported lack of awareness of where patients can receive LVRS was small but still should be addressed. It is possible that even on an anonymous survey, responders did not want to admit this lack of awareness. Future research to determine specific barriers to referral for LVRS can culminate in the production of educational materials that include appropriate referral criteria and that have the ability to be personalized to list local services. Local low vision providers can then send out this new educational material to other eye care providers in their area. In the same vein, more local and regional continuing education on topics pertaining to LVRS and the treatment of patients with vision impairment would provide eye care providers with additional information that could be used when deciding whether or not to refer a patient for services.

The main reason given by both optometrists and ophthalmologists for referral for LVRS was difficulties with activities of daily living. Functional difficulties will only be revealed if functional questions are asked. One suggestion is for eye care providers to develop and utilize functional checklists. Most if not all medical and optometric offices have patients fill out paperwork prior to examination. Many offices have support staff who assist with this paperwork, and in some offices, support staff take the case history. Adding a functional checklist would give the eye care provider valuable information and would only add a short amount of extra time to the history portion of the examination. The checklist could be a simple yes/no or a scaled response format.

Stelmack et al. showed that the National Eye Institute Visual Functioning Questionnaire 25 plus supplement (NEI VFQ-25) can be used as one measure of the impact of low vision on quality of life.⁴⁵ The development of a standardized functional checklist to be used as a means of promoting referral to LVRS based on functional difficulties would be a worthwhile endeavor for future research.

Conclusion

This survey attempted to determine referral patterns and barriers to referral for LVRS in the drawing area for the Southern College of Optometry, the Mid-South Tri-State Area. Due to small sample size as well as marked differences in sample size of optometrists and ophthalmologists, it is only possible to note general trends and make recommendations based on those trends.

Results from this study are in line with previous results in the literature, demonstrating that eye care providers are referring patients for LVRS based on difficulties with activities of daily living. Yet, the majority of responses show that patients are not referred for LVRS until they have significantly reduced visual acuity or visual field loss, and therefore severe functional difficulties.

The majority of survey respondents did not provide a reason for making infrequent referral to LVRS, giving no insight into barriers to referral on the part of the doctor. A minority of responses cited transportation and financial restraints as notable barriers on the part of the patient. Future use of the

modified version of this survey is warranted, with efforts toward increasing response rate to identify barriers to referral as well as to isolate specific trends. This information can be used to develop educational materials that can be presented and distributed to eye care providers to maximize effective referrals to LVRS. Removing barriers to referral is in the best interest of all eye care providers as the end goals are increased access to care and improved quality of life for low vision patients.

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Appendix A: Survey Document

Survey: Referral Patterns in Low Vision

1. Degree OD MD
2. Years in Practice: 1-5 6-10 11-15 16-20 20+
3. Practice Setting (please check all that apply):
 Academic Hospital Private Practice (solo)
 Private Practice (group) Affiliation with Retail Establishment
4. Specialty:
 - a. Primary Care
 - b. Ocular Disease (general)
 - c. Ocular Disease (Retina)
 - d. Ocular Disease (Glaucoma)
 - e. Ocular Disease (Anterior Segment)
 - f. Contact Lenses
 - g. Pediatrics
 - h. Vision Therapy
 - i. Low Vision
 - j. Other (please specify) _____
5. Have you ever referred a patient for Low Vision Rehabilitation services? Yes No
6. What is the primary reason you consider referral for Low Vision Rehabilitation services?
 - a. Patient expresses difficulty with activities of daily living (i.e. reading, driving)
 - b. Measure certain level of visual acuity loss
 - c. Presence of ocular disease that leads to visual impairment
 - d. Other (please specify) _____
7. Which level of best corrected visual acuity would you consider necessary to warrant referral for Low Vision Rehabilitation services? 20/40 20/50 20/60 20/70 20/80 20/100 20/200 20/400
8. Which level of visual field loss would you consider necessary to warrant referral for Low Vision Rehabilitation services?
 - a. Central visual field loss yes no
 - b. Peripheral visual field loss yes no
 - c. Hemianopsia yes no
9. On average, how many patients with the following conditions do you see per week?
 - a. Diabetic retinopathy 0-5 6-10 11-20 21-30 more than 30
 - b. Macular degeneration 0-5 6-10 11-20 21-30 more than 30
 - c. Glaucoma 0-5 6-10 11-20 21-30 more than 30
 - d. Congenital eye disease causing reduced vision 0-5 5-10 11-20
 - e. Optic atrophy (congenital or acquired) 0-5 5-10 11-20
 - f. Visual deficits secondary to CVA 0-5 5-10 11-20
10. Which of the following symptoms do you ask about during your case history?
 glare difficulty reading difficulty driving difficulty seeing TV
 difficulty with mobility dry eye
11. Do you do any of the following routinely?
 Rx +3.00 add or higher Evaluate patients for magnifiers Evaluate patients for telescopes test contrast sensitivity perform Amsler Grid
12. If you rarely (less than twice a year) refer patients for Low Vision Rehabilitation services, what factors prevent you from referring more frequently? (check all that apply)
 I am well-qualified to offer those services myself
 I don't encounter patients who need those services more than once a year
 Nothing can be done for patients with visual disabilities
 My patients will never be returned to me for primary eye care services
 I am unaware of where my patients can receive those services