Low Vision in Primary Care Optometry*

Randy T. Jose, O.D.
Robert A. Browning, O.D.
Richard L. Brilliant, O.D.

Abstract

A low vision examination procedure has been devised to differentiate those low vision patients who can be helped by the primary care practitioner from those who require referral to a specialized low vision clinic for help via optical aids and/or rehabilitation.

Abrégé

Une procedure d'examen en basse vision a été developpé pour déterminer quels patients de basse vision peuvent bénéficier de soins du practicien de premier ligne de ceux qui doivent être référés à une clinique specialisée en basse vision pour l'obtention d'un aide en basse vision et la rehabillitation.

Every optometrist has been faced with the problem of managing the low vision patient in the busy private practice setting. It is difficult to gain enough experience to know when to refer and when to provide services because of the low incidence of low vision patients in the private practice. If the practitioner decides to refer, then he risks sending the patient for unnecessary extended trips and creating financial burdens for the patient. Many times the patient cannot be helped by the "low vision centers" and/or the patient could have been helped with simple bifocal adds, etc. without having to have made the trip.

This is a constant dilemma for a primary care optometrist, so the authors developed a minimum low vision diagnostic sequence which will allow the practitioner to more confidently refer patients for this specialized care. The purpose of the sequence is to:

1. Identify those patients who can be helped or whose care can be initiated in the *local* primary care setting.
2. Identify those patients that will respond to low vision aids but have problems beyond the scope of the primary care setting.
3. Identify those people who are not candidates for low vision aids, so that unnecessary referrals will not be made.

The doctor will be able to make these determinations based on good clinical data if the sequence is used. This initial exposure to low vision aids allows the primary care clinician to give the patient specific reasons for the referral and essentially becomes a "diagnosis." This primary care clinician maintains management of the patient through this type of knowledgeable referral. The sequence also benefits the low vision clinician since the patient arrives with some realistic knowledge of low vision aids. The minimum low vision diagnostic sequence will help the primary care clinician enjoy the rewards of managing low vision patients within the scope of his/her practice and avoid the frustrations of trying to work with patients needing a multi-disciplinary service center.

It is important to define primary and secondary care. A primary care setting is designed to handle a large number of people in a short period of time. All routine problems and even some specialized problems can be handled in this time frame. If problems exist beyond this time frame (psychological and/or physiological) then this one patient starts interfering with the primary care clinician's responsibilities to his/her other patients. It is at this point that secondary care services are needed. Under this definition the referral is made because the patient needs time committments (and maybe special equipment/lenses) that are not within the scope of a well-managed primary care setting and *not* because the primary care clinician is incapable or incompetent. . . .

Primary Care Low Vision is obtaining enough data in a short period of time to make a reasonably accurate prognosis for solving the individual's reported problems with low vision aids. Generalizing, the presbyope is an excellent example of a primary care low vision patient. As the near point acuity gets lower, the lenses needed are stronger and the patient's use of the lenses is more stressful. Some people adapt to the limitations of these stronger lenses and others need to be trained to comfortably use them. The need for patient training and redesigning of lens systems is the point at which the patient becomes a candidate for secondary care services. All optometrists practice low vision daily with geriatric patients. As the problems become more severe, more time is needed to resolve them. The secondary care service is organized to provide this extra time (average eight hours per low vision patient), has the additional professional staff to handle these patients, and usually maintains a larger inventory of aids to resolve unique problems. The "specialist" is simply the clinician who has a special interest in working with these unique problems and has the support facilities to accommodate all the needs of these low vision patients. The secondary care clinic is a resource for the primary care optometrist.

The examination sequence which follows will assist the interested optometrist in identifying which pa-

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tients can adapt to aids easily and which will need the extended time offered by the interdisciplinary center.

The Minimum Low Vision Diagnostic Series is presented in an annotated outline form so it can be referred to when that occasional low vision patient arrives in the office (usually unexpected and on the busiest day!).

1. Case History

The case history should include the following basic information:

A. Has the patient successfully used optical aids before? (If so, there is a better prognosis for success with aids since the patient is familiar with them.)
B. Does the *patient* know the cause of the impairment? (If the patient says, "I'm blind," there may be problems with motivation. The patient is dwelling on the loss of vision.)
C. Does the patient travel around by himself/herself? (Mobility is an indication that the patient is using his/her residual vision.)
D. How does light affect vision? (Sometimes a visor or sunglasses can solve most of the patient's problems.)
E. What kinds of social activities does the patient engage in? (Again, this gives the examiner an idea of how much the patient is using residual vision.)
F. Does the patient have special vocational/educational problems attributed to the vision loss?
G. What special problems does the patient want the doctor to solve? (Be careful of the "I want to see you again" syndrome. This person will need lots of attention.)

Generally speaking, the case history should give you a good clinical impression of:

1. How independent this person is and how much the residual vision is being used.
2. Specific problems that will most motivate the patient when you are deciding on a prescription.

II. Distant Visual Acuity

This is the first and most important diagnostic test. It can be the first time a patient has actually read a chart. Use a Feinbloom Number Chart (see Figure 1) or at least a regular wall chart. Use the following procedure:

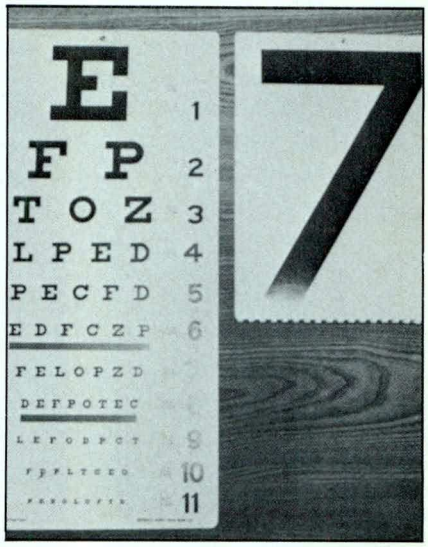

Figure 1. The Designs for Vision Number Chart has a range of acuity optotypes from 2/700 to 20/20. At two feet a 20/7000 equivalent acuity can be obtained. Likewise, the AO Chart at two feet gives you an equivalent acuity of 2/200 or 20/2000.

A. Present the Feinbloom 700 foot number (2/700 or 20/7000) or the Snellen 200 foot letter (2/200 or 20/2000 at two feet).
B. Back off to ten feet (five is acceptable if the patient reports the letter or number is getting blurred at this distance).
C. Let the patient read the numbers or letters on the chart slowly. Encourage the patient to guess and isolate the *optotypes* to get greater success. The more letters or numbers the patient is able to read, the more confidence the patient will have in the examiner. That is why it is important to work at five feet instead of ten feet if in doubt.
D. Repeat for the other eye. Usually start with the *reported* better eye first. Always get a measurement of each eye even when the patient says there is no vision in the other eye.
E. Since the Feinbloom Chart allows acuities of 20/7000 (700 foot letter at two feet) to be recorded, there is no reason to use the antiquated term "finger count." (If a patient can count fingers, he can see a 20/200 E.)
F. Some patients need to eccentrically view in order to obtain the best acuity. Encourage the patient to "look around the blind spot" and observe the position of the eyes when the best acuity is obtained.

III. Refractive Error Determination

Before investigating any optical aids, be sure that any acuity loss noted is due to the pathology involved and not due to previously uncorrected refractive errors.

A. Use a trial frame for objective and subjective testing.
B. Perform radical retinoscopy at 20 cm or closer if necessary to obtain a reflex. At least get a starting point for the refraction.
C. Do Keratometry to discover possible astigmatic refractive errors. Keratometry can be done on individuals with nystagmus. Do not cover the non-tested eye as this may increase the nystagmus.
D. If a retinoscopic reflex cannot be obtained, begin the subjective utilizing $\pm 2D$; $\pm 5D$; $\pm 10D$ and $\pm 20D$ lens choices to elicit some response. Work with $-2D$ and $-5D$ cyls at the four major meridians as a subjective test for astigmatism.
E. Record the new refraction with the new acuities. Demonstrate this to the patient in the trial frame and then compare it to the old Rx. Often the patient will report no difference even though the re-

corded acuities indicate seemingly significant improvements.

F. Repeat for the other eye. Never consider an eye hopeless without trying. The subjective should be a relaxed procedure. Do not hurry decisions and use large lens changes as needed for the patient to see a difference.

IV. Telescopic Evaluation

The clinician will need only two telescopes to ascertain the patient's prognosis for successful use of telescopic devices: A 2.5x monocular telescope and a 6x/8x combination monocular telescope. In Figure 2, the Selsi 2.5x and 6x/8x are shown. The 6x has the shorter objective and the 8x has the larger objective. Use the following guide to determine the appropriate telescope to use:

1. 20/100, best corrected distant acuity or better	2.5x
2. 20/100 to 20/300 best corrected distant acuity	6.0x
3. 20/300 to 20/600 best corrected distant acuity	8.0x
4. If the best corrected distant acuity is less than 20/600	Poor prognosis for use of telescopes without extended training.

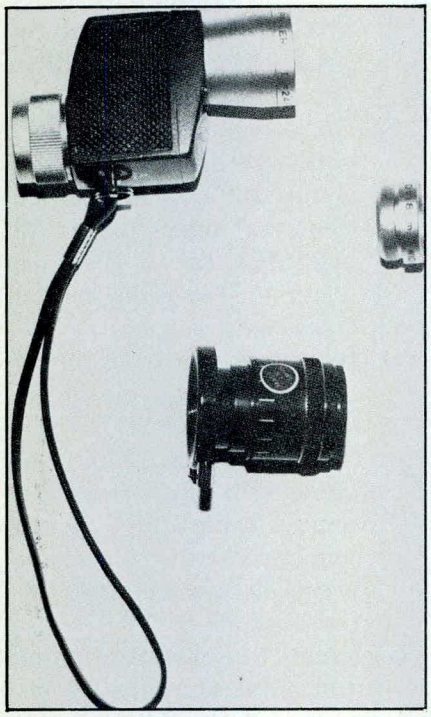

Figure 2. The 6x-8x Selsi Telescope has two objectives. The telescope is shown with the 8x objective mounted. This can be removed and the shorter 6x objective used instead. The 2.5x Selsi is used for those individuals with better acuity.

After determining which telescope to initially evaluate, the following procedures should be done (nystagmus is not a contraindication to the use of telescopes):

A. The doctor should focus the telescope initially for a ten foot viewing distance.

B. Have the patient locate a large object at the end of the room first. Having the patient find the doctor's white coat while he/she stands next to the chart is often helpful to the patient in getting oriented and locating the acuity chart.

C. If the patient cannot find the chart within a few minutes, discontinue the test. Do it in a positive manner by indicating that you "have another test to get that information. . . ."

D. If you are using the 6x telescope, the successful patient will be the one who quickly finds the chart and reads at an acuity level six times better than the habitual acuity (i.e., from 20/300 to 20/50).

V. Nearpoint Acuities

The chart easiest to use for this is the Lighthouse Near Acuity Test Chart (Figure 3). This chart is already calibrated to assist in determining a *starting point* for the near correction.

A. Hold the Chart at 40 cm.

B. Determine the optimum lighting level for the patient.

C. Have the patient read only one column of letters: (right column—right eye, etc.)

D. Look for eccentric viewing and/or encourage patient to eccentrically view.

E. Record monocular acuities—again record for both eyes.

F. For those who cannot read any letters at 40 cm, move the chart to 20 cm and obtain an acuity. If the patient reads 4M it is recorded as .2/4M instead of the 40 cm notation .4/4M. (These people will usually be candidates for referral.)

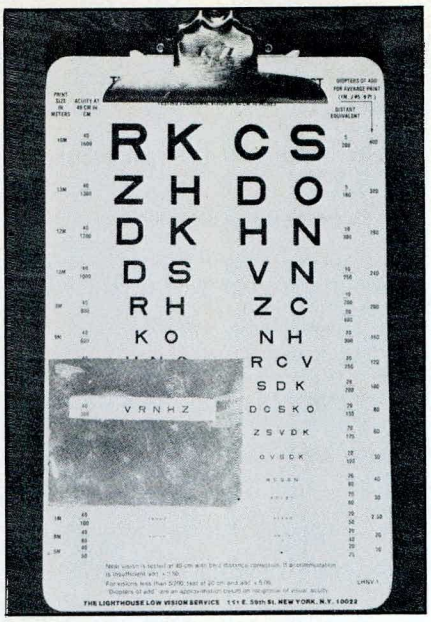

Figure 3. The Lighthouse Near Acuity Test Chart is an excellent card for taking near acuities. The optotypes are well spaced, high contrast and the right hand column indicates the dioptric lens needed for the patient to read 1M. A typoscope or reading slit enhances contrast.

VI. Microscopic Evaluation

Improving an indiviual's ability to read or at least identify words at near is the easiest task to work with in low vision. However, it must be approached with success or the patient will be easily frustrated.

A. After getting the best acuity for the better eye, note the dioptric value of that line on the right hand side of the Lighthouse Near Acuity Test Chart (Figure 3). This dioptric value indicates the approximate magnification the patient needs in order to "see" 1M* print, (i.e., can *see* newsprint) size letters but can usually only *read* larger typewritten materials). This number is doubled if the acuity was taken at 20 cm.

B. Adjust the lighting on the chart again to an optimum level.

C. Place the appropriate lens power from your trial lens set or AO microscopic set in a trial frame.

*The M notation of near acuities is described in detail in the text Low Vision Care by Edwin Mehr and Allan Freid. Professional Press.

D. Have the patient place the card on his nose and push it away until it comes into focus. Measure this distance. It should equal the focal length of the lens in the trial frame. If not, adjust the distance for the patient to see if the letters clear up subjectively. If not, record this variation in distance as it may indicate uncorrected refractive errors or other problems.

E. Have the patient read down the column of letters to 1M print. Always check lighting and focal distance as the patient reads down the chart.

F. The patient should be able to read 1M print with the indicated lens power. Note any discrepancies and try to figure out why 1M was not read. Was it refractive error problems, field losses, confusion, avoidance of working distance, etc.?

You may wish to use a typoscope (reading slit) for the nearpoint evaluation. It helps the patient keep his place when using the microscope and it sometimes leads to dramatic improvements in acuity due to the contrast enhancement it provides. Illumination and contrast are very important aspects of the nearpoint evaluation.

VII. Visual Fields

Visual Fields are performed on every patient with the main intent being to determine the extent of the intact retina available for magnification. Fields are usually performed before evaluating aids, but they can be done at any point during the sequence when a severe field loss is expected. For instance, if the patient shows excessive scanning when taking acuity measurements, this may be indicative of very restricted fields. The usual techniques are used with some exceptions:

A. Tangent Screen is a good routine test. Use large 6mm to 20mm targets. An X can be taped at the fixation point to help those individuals with central scotomas maintain steady fixation (Figure 4). The clinician should observe the patient throughout the test for fixation changes, eccentric viewing, etc.

B. Perimetry is performed on those patients who exhibit severe field defects with tangent screen testing. It gives more information pertaining to a patient's reported mobility problems. Again, large test targets and enlarged fixation targets will increase the reliability of the patient's responses.

C. Amsler grid describes how a patient is *eccentrically viewing*. The chart with the fixation cross is the best to use. Have the patient fixate "normally" and then plot the loction of the scotoma. If it's central, the patient may need eccentric viewing training. If the scotoma is to the right of fixation, the patient may have to be trained to eccentrically view superiorly. When the scotoma is to the right of fixation, it will interfere with reading with optical aids.

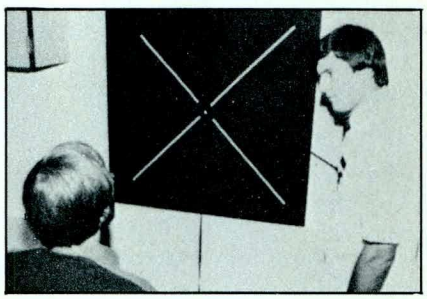

Figure 4. Masking tape can be used to make a cross on the tangent screen to help the patient with central scotomas fixate more steadily.

This is the basic set of diagnostic tests that comprise the minimum diagnostic low vision sequence. Of course a complete health evaluation is a mandatory part of any workup. Any medical problems will usually be attended to prior to initiating low vision services.

VIII. Patient Management

The data should be analyzed and one of the following decisions should be made:

A. Patient Cannot Be Helped—the acuity is so poor, expectations so high (looking for a miracle cure) and responses to aids were not impressive. The patient is advised that other rehabilitation services are available. Since the patient knows what low vision aids are—he/she can return for further evaluation if it is decided that one of the aids described and/or shown would be of potential benefit. The decision that a patient cannot be helped is now based on hard clinical data. The clinician still leaves the patient on a positive note and better educated as to rehabilitation potentials.

B. The Patient Can Be Best Managed in the Private Local Setting—the patient has realistic expectations, specific tasks in mind that are reasonable and the acuity levels and responses to aids indicate that the patient should be able to attain the established goals, with a minimum of training.

C. The Patient Needs a Multidisciplinary Evaluation—this patient has the acuity to use aids but not the motivation. There are complicating factors to the successful use of aids such as small central 5° fields, multiple central scotomas, 20/600 acuity or worse, resistance to working distances or inability to comfortably use aids due to fine-motor problems.

Figure 5 shows a graph that may help the clinician depict the patient pictorially in trying to make the management decision. If all the plotted points are to the left (i.e., very active patient with 20/60 acuity, full fields, needs +8 diopter add to read 1M and successfully used a 2.5x telescope) the patient should be initially managed in the office. If the patient is not very active, has 20/400 acuity, has 10° fields and did not respond well to the use of a 10x micro-

scope (lost his place, resisted work distance), couldn't use a telescope well and had no specific objectives other than wanting to see better; all the plotted points will be to the right and indicate the need for the secondary care approach of an interdisciplinary team. The graph should help in the analysis of the first few cases. As more patients are seen and services provided in the office, the clinician will gain more experience in making these management decisions and will gain the clinical confidence to try to work with a wider array of clinical problems presented by the low vision patients.

The equipment needed is minimal, and can be obtained from the companies indicated. A partial list of companies is included. These companies should be contacted for catalogues and the clinician should become familiar with the aids available through each.

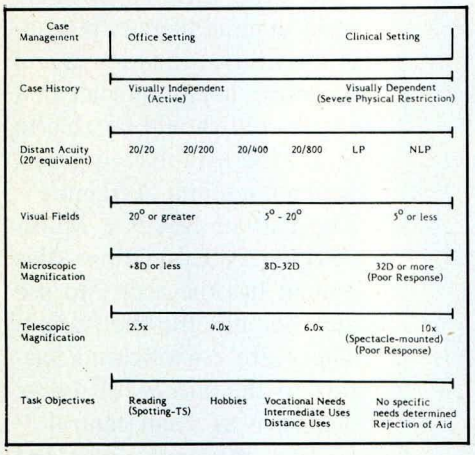

Figure 5. This represents a graphical presentation of data obtained from the Minimum Diagnostic Sequence. It may be useful to the clinician in making initial management decisions. All plots on the left are indicative of a patient who can be managed in the private practice.

Equipment: Low Vision Diagnostic Sequence

1. 2.5x Selsi Monocular—148A—Lighthouse
2. 6x—8x Selsi Monocular—162—Lighthouse
3. Near Acuity M Cards—LHNV—1—Lighthouse
4. AO Nearpoint Paragraph Cards—American Optical
5. Distant Test Booklet—Designs for Vision
6. Basic Microscopic Trial Kit—American Optical
7. E.F. Trial Lens Clips—Bernell Corporation
8. Trial Lenses/Trial Frame/Tangent Screen/Amsler Grid available in practitioner's office.

Resources:

American Optical Company
Low Vision Aids Service
Dept. 3401, P.O. Box 1
Southbridge, Massachussetts 01550
(617) 765-7711 ext. 3259

Optical Aids Service
Lighthouse for the Blind
111 East 59th Street
New York, New York 10022
(212) 355-2200

Designs for Vision
120 East 23rd Street
New York, New York 10010
(800) 221-7974

Bernell Corporation
422 East Monroe Street
South Bend, Indiana 46601
(219) 234-3200

Selsi Optical Company
40 Veterans Boulevard
Carlstadt, New Jersey 07072

Keeler Optical Products, Inc.
456 Parkway
Lawrence Bank Industrial District
Broomall, Pennsylvania 19008

Recreational Innovations Co. (NOIR)
P.O. Box 109
South Lyon, Michigan 48178

Sam Walters, Inc.
412 West 6th Street, Suite 625
Los Angeles, California 90014
(213) 622-0744

OIO Products, Ltd.
P.O. Box 613
Mauhasset, New York 11030
(516) 487-8576

Visual Tek
1830 Lincoln Boulevard
Santa Monica, California 90404

Summary

The minimum low vision diagnostic sequence consists of a battery of tests that can be easily incorporated into the routine of the private office. Perhaps with the exception of the total case history and the refraction, the diagnostic series can be administered by an optometric technician in the extremely busy office. In any case, it provides the practitioner with an easy mechanism to insure that all the low vision patients receive appropriate care either through direct services or referral. Referring a patient through this system can be as effective a practice builder as if the total service was provided in the office. The practitioner can evaluate the data collected and make one of three determinations:

1. No further help is possible.
2. I can handle this case in my office.
3. This patient should be referred for a comprehensive rehabilitation program. The practitioner has the data to tell the patient exactly why the referral is being made and has demonstrated the need for referral to the patient, thus maintaining excellent patient management.

This decision is based on information from the case history, visual acuities, magnification responses, and visual fields. The interrelationship between these data and the various factors involved can be weighed and a decision made based on clinical data.

The equipment needed to administer the minimum low vision diagnostic sequence is relatively inexpensive (approx. $350.00) and is listed in detail. The sequence is outlined for quick reference and should be utilized as a step by step guide for the first few patients. As the practitioner gains some skills and familiarity with this aspect of optometric care, individual modifications can be made to the sequence to suit the individual's mode of practice. Hopefully this approach will be useful to

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New Optometric Institute of Toronto Looks to Future

In a recent news release, the Board of Directors of the Optometric Institute of Toronto announced that it has received its Letters Patent as a non-profit corporation.

The objectives of the newly-created Institute are as follows:

(a) To assist in the advancement of the standard of optometrical services in the community and to promote and conserve the vision of the public, and to foster inter-professional coordination in so doing;

(b) to provide facilities for continuing optometrical study and education for optometrists;

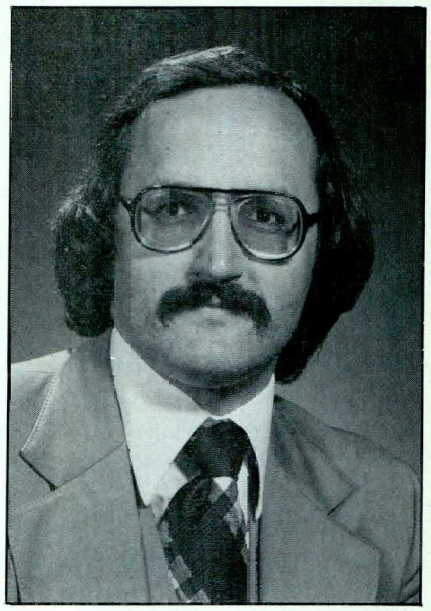
(c) to promote, encourage and to participate in the advancement of optometrical research and preventative optometry;

(d) to arrange for the provision of clinical facilities for the practice of optometry for the objects stated in (a), (b) and (c) above;

(e) to encourage participation of the public in the operation of the Institute;

(f) to disseminate information to the public for the purpose of promoting and conserving the vision of the public.

The Institute, as indicated by its objectives, will sponsor the provision of the full spectrum of optometric care. Clinical programs will involve general examinations, binocular vision, low vision, contact lenses and special diagnostic procedures. Initially, emphasis will be on primary care services with other areas developing more fully as referral sources increase. Out-reach programs for underserviced segments of the population will receive priority status. It is expected that these clinical programs will be operational prior to July of this year. Additionally, the Institute will provide continuing education programs with a clinical orientation and foster clinical research of importance to examination procedures, diagnosis and therapies. The Institute will serve as a stimulus to learning and as a model for the delivery of optometric care.



Dr. Mitch Samek, newly-appointed Executive Director

In acknowledging the support and co-operation of the College of Optometrists of Ontario and the Ontario Association of Optometrists, the O.I.T. Board said, "They have fullheartedly supported the concept of the Institute and assisted in bringing incorporation to fruition. The School of Optometry similarly has supported the goals and objectives of an Institute. In addition, more tangible support has been provided by all three; the Association and the College have provided financial support and the School has offered the loan of equipment."

Arrangements are being finalized for the development of our educational/clinical facility in the Danforth and Pape area of Toronto. Approximately 3000 square feet of space have been leased as the initial home of the Institute. Currently, considerable time is being devoted to office and equipment needs as well as to a developmental framework for our future activities.

Dr. Mitch Samek has been appointed as Executive Director of the Institute. Dr. Samek was engaged in private practice for a number of years before returning to graduate school. He received his M.Sc. in 1974, with emphasis in Clinical Epidemiology. Dr. Samek continued his graduate work in the area of continuing education for health professionals, at the University of British Columbia. He joined the faculty of the School of Optometry, University of Waterloo, in 1978. Dr. Samek has published a number of papers in the areas of optometric public health and epidemiology. He is a member of the Ontario Association of Optometrists, The Canadian Association of Optometrists, and a Fellow of the American Academy of Optometry.

The formation of the Institute and appointment of its Executive Director should generate amongst all optometrists excitement and enthusiasm for this opportunity for our profession to enhance its growth and development.

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the practitioner and will result in better care for our visually-handicapped population.

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