Article

Optometric Guidelines for School Consulting

Developed by College of Optometrists in Vision Development (COVD) Vision, Learning and Performance Task Force

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I. SCHOOL VISION PROGRAMS

A. Introduction

A number of people—adults as well as children—struggle with learning at school and in the office. When a child is not performing adequately in school, it is crucial to determine the source of the problem. Learning is based on complex interrelated processes, one of which is vision. Optometrists and educators have been interested in the relationship between visual efficiency and the acquisition of reading skills for nearly a century. Visual processing is a fundamental part of the reading act. Before visual information processing/visual auditory encoding, the initial phases in reading involve visual sensory processing which must operate automatically and efficiently for optimal reading to occur.

School-based vision programs are often needed to enable children to perform optimally in today's academic environment. A number of school vision programs are currently being implemented around the United States. These programs can address vision care and educational goals as well as provide unique services and opportunities for educators and students.

The mission of a school-based vision program is to:

1. Improve the academic performance of children by enhancing their visual function, thereby allowing them to respond better to educational tasks.
2. Improve quality of life by reducing learning related visual symptoms, thereby allowing children to perform to their maximal learning potential.

B. Importance of using an Optometric School Consultant

To develop the most effective school vision program, it is imperative that a school work directly with an Optometric School Consultant. If administered inappropriately and without optometric supervision, some school vision programs may result in stress and frustration in both the students and the faculty and may exacerbate certain visual problems. By using an Optometric School Consultant, a school vision program would be well positioned to address the learning related visual needs of its students.

The Optometric School Consultant or a specially trained individual, designated by the school and under the supervision of the Optometric School Consultant, acts as the program coordinator. The Optometric School Consultant can train vision screeners, interpret all data, and work with school personnel. For the students who fail the screening, the Optometric School Consultant will ask the coordinator to recommend referral for outside comprehensive visual evaluation. School aides and teachers will implement daily vision program ac-

tivities for all selected students. The Optometric School Consultant will monitor progress and will recheck students appropriately.

C. How to initiate a School Vision Program

Across the country, many school vision programs have been initiated. The type of program used is dependent on a number of factors: school interest, finances, time and staff resources, availability of an optometric consultant, etc. The level and type of vision program is quite variable. Examples of such programs include:

1. Children are sent for vision therapy treatment at a private optometric office; no treatment given at school.
2. The optometrist and vision therapists provide vision therapy treatment in the school.
3. Group vision development activities including oculomotor, bilateral integration, and binocular activities are provided at the school through the use of teachers and aides under direct optometric supervision.

These school vision programs have most often been initiated through the personal efforts and interest of a teacher, principal, or administrator. It is crucial that the Optometric School Consultant be actively involved in vision programs, as some schools are initiating programs without optometric consultants.

Recommended steps in initiating a school vision program include:

1. Provide in-service for school personnel.
2. Provide in-service to parents, service groups, other interested parties.
3. Select, train, and implement selected vision screening tools.
4. Appropriate referral for comprehensive vision examination.
5. Initiate daily school vision activities.

An information sheet should be sent to each student's parent/guardian. The information sheet should be signed by the parent/guardian and returned to the school before vision screening and/or vision activities are initiated. This information sheet should explain the vision screening and the proposed school vision program. Include a statement emphasizing that the vision screening does NOT take the place of a comprehensive vision examination. If referrals for comprehensive vision evaluations are made, it should be clear as to who is responsible financially for the evaluation, glasses, and private optometric treatment if indicated.

The school vision program should receive funding and support from the school system, just as other types of programs (occupational therapy, speech therapy, etc.) are funded. Supplementation from private grants or support from service groups such as Rotary, Lions, or Kiwanis may be possible. The cost of running such a program is dependent on the depth of the program, optometric consultation time, and required equipment. The Optometric School Consultant should not be a volunteer position, but a paid professional position. The Optometric School Consultant has a number of options for financial reimbursement, including payment on an hourly basis, per child, or agreed sum for a set program.

D. Additional Resources

See the Bibliography (Appendix I) and the Resource listings (Appendix II) for additional references, address, and telephone numbers. The American Academy of Optometry, American Optometric Association, College of Optometrists in Vision Development, and Optometric Extension Program have joint organizational policy statements on "Vision, Learning, and Dyslexia" (Appendix III) and on "Vision Therapy" (Appendix IV). A directory of optometrists who are board certified in vision development and therapy is available through the College of Optometrists in Vision Development (COVD). SEE TO LEARN is an innovative 3-step health program initiated by the Kansas Optometric Association, designed to educate parents and teachers and to provide vision care for pre-kindergarten and school-age children (see resources).

II. VISION SCREENING TOOLS

A. Setting up a Vision Screening Program

Screening for vision problems is an appropriate and very important part of school health services.

The National PTA Convention passed a resolution (Appendix V) in June 1999 titled

"Learning related vision problems—education and evaluation." Excerpts of the text follow:

> Resolved, that National PTA, through its constituent organizations, provide information to educate members, educators, administrators, public health officials and the public at large about learning related visual problems and the need for more comprehensive visual skill tests in school vision screening programs performed by qualified and trained personnel; and be it further
>
> Resolved, that National PTA, through its constituent organizations, urge schools to include in their vision screening programs tests for learning related visual skills necessary for success in the classroom.

What is screening and why should you do it?

Screening is designed for early identification of disease and functional disorders. If we can identify a condition before it becomes symptomatic, then diagnosis and treatment can be undertaken at the optimum time and may decrease cost in treatment. The success of any screening program ultimately depends on securing the cooperation of school personnel, the child, eye doctors, and others who may be participating. Arrangements which cause problems (delays, inconvenience, etc.) may lessen willingness to participate and thereby limit the effectiveness of the program. Steps which may be helpful in implementing the vision screening program include:

1. Communicate fully with students parents, and eye doctors.
2. Provide both an appropriate screening site and support staff conducive to student comfort.
3. Protect confidentiality.
4. Know what resources are available in the community.
5. Work with the community to establish new resources.
6. Monitor vision screening outcomes, i.e., did the referred child ever receive a vision evaluation; did the evaluation address the problems found in the vision screening?

Who is to be screened?

Depending on state law, this may vary. Usually all students in preschool, kindergarten, 1st, 2nd, 3rd, 5th, 7th, and 9th grades are screened in addition to all children new to the school system, all children referred by school personnel, high risk children, and all students in special education programs.

What screening tools should be used?

Vision screening procedures varies greatly from district to district. State laws or regulations may dictate minimum screening standards. Currently, the most common tool used for vision screening in the school setting is the Snellen test of visual acuity. While this tool is useful as a test of distance visual acuity, it does not test any of the other visual abilities needed to be a good learner. The visual needs of learning can be categorized under visual pathway integrity (ocular health, refraction, visual acuity, color vision), visual efficiency (eye focusing, eye teaming, eye movement control) and visual information processing (visual perception, visual-auditory, and visual motor integration). A vision screening is not a comprehensive vision examination nor can it substitute for one. The more involved the screening, the higher percentage of children will be identified as "at risk" for visual problems.

B. Recommended Vision Screening Tools

A number of different vision screening tools and programs have been developed. They vary in their ability to effectively detect children who have a potential vision program and need referral for a complete vision examination and those who do not. The AOA booklet on vision screening presents a number of screening tests.

Every screening procedure will result in some over-referral or under-referral. As an Optometric School Consultant, you can assist in helping to select those procedures that will be most effective based on the limitations of the screening program.

The following are recommended options for vision screening tools: (See the Resource Section in Appendix II for information on sources for obtaining screening tests.)

1. New York State Optometric Association (NYSOA) vision screening battery and Developmental Eye Movement Test (DEM)
   A. This in-depth screening requires visual screeners (nurses, assistants, volunteers, etc.) and an optometrist.

B. Screens for visual acuity near and far, farsightedness (plus lens test), eye focusing facility, eye teaming (near point of convergence, Keystone fusion skills, Titmus stereo), eye movement control (King Devick or more current Developmental Eye Movement Test), color vision, visual motor integration (Winterhaven copy forms).

2. Parents Active for Vision Education (P.A.V.E.)
   A. This in-depth screening requires vision screeners as well as an optometrist.
   B. Screens for visual acuity near and far, eye movement control (King Devick, versions), eye focusing facility, eye teaming/convergence (Wirt stereo, Keystone fusion, near point of convergence, cover test), eye structure/eye health (pupils), refractive status (retinoscopy), color vision, visual motor integration (Beery VMI).
3. Coors Screening
   A. An inter-disciplinary vision screening; endorsed by the Colorado Department of Education, Colorado Department of Health, Colorado Ophthalmological Society, Colorado Optometric Association.
   B. Screens for history and external observations (checklist), distance visual acuity, hyperopia (plus lens test), eye teaming (near point of convergence, alternate cover, stereopsis), color vision.
4. Additional screening tools
   A. Checklist
      A checklist should be used with all screenings. The checklists could be completed by the teacher and/or parent. The checklist should be reprinted in parent's newsletters, PTO mailings, etc. Checklists include: Coors checklist—also available in Spanish (Appendix VI), COVD vision symptom checklist (Appendix VII), PAVE performance checklist (Appendix VIII), OEP checklist, Crane performance checklist.
   B. Visagraph
      The Visagraph II is a computerized instrument that uses infra-red goggles to measure eye movements while the subject is reading. This recording and analysis of a subject's eye movements allows a teacher to make direct objective evaluations concerning a reader's efficiency. This visagraph information in conjunction with the findings from vision screening tools listed above, can be used in designing a program to develop reading fluency and to remedy deficiencies in visual-functioning, perception, and cognition. Visagraph methodology is described in the Visagraph II Eye-Movement Recording System manual.
   C. Visual motor integration screening
      Beery Visual Motor Integration Test or similar test may be used. Other options include Wold Sentence Copy or Winterhaven Copy Forms.

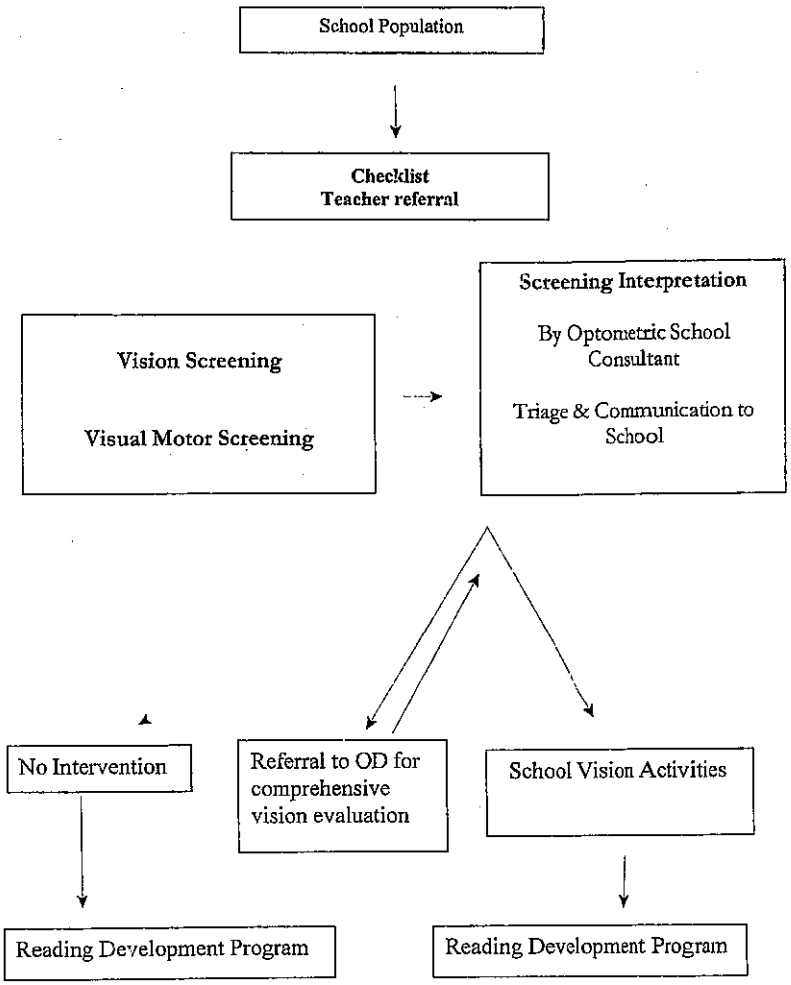
III. SCHOOL BASED VISION DEVELOPMENT PROGRAM

A. Optometric Supervision

The school vision program presented in this manual is by no means as extensive as other available programs. Ideally, in-office vision therapy treatment provides the most comprehensive and individualized program. However, due to financial concerns, number of youngsters needing treatment, parent participation, etc., the vision program often needs to be brought to the school. Thus, the proposed model program presented in this manual is currently being used to provide vision development assistance to students in a public school setting. It may be adapted as needed for different types of school settings.

B. Proposed Model

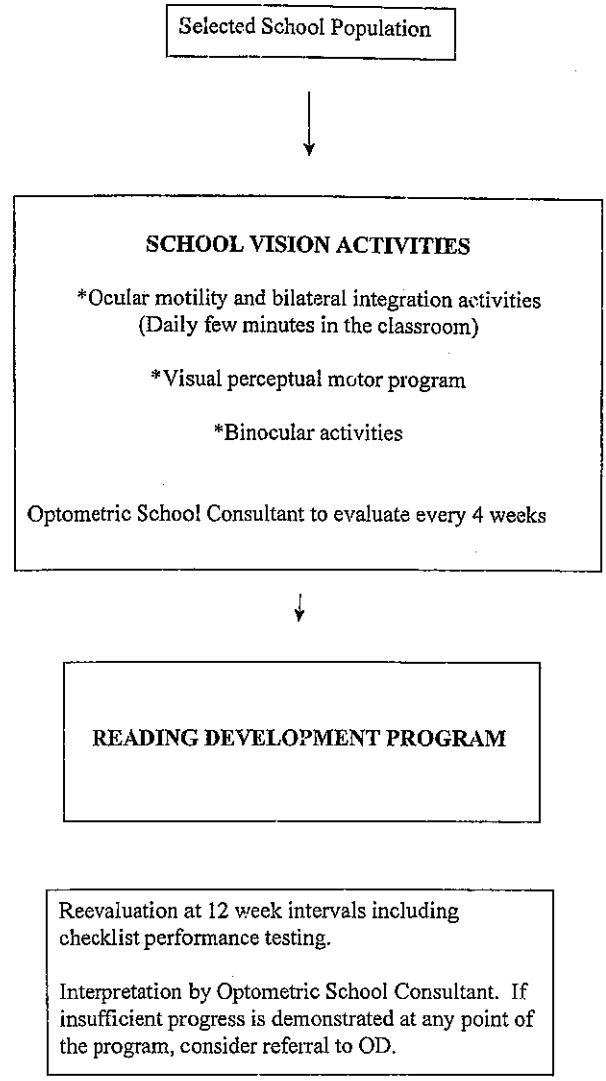
1. The school personnel and optometric consultant should agree on the target population. For some schools, all children may be targeted. Other schools may only choose lower performers or selected subgroups.
2. The checklist should be completed by the teacher and if possible, a parent as well.
3. Choose and implement specific vision screening tools for your school. The optometrist might be directly involved in parts of the screening. In other cases, the optometrist might supervise school personnel or parents involved in the screening.
4. The optometrist reviews all vision screening data and makes appropriate recommendations for referral for a comprehensive vision evaluation (outside of the school), no intervention, and/or participa-



SCHOOL VISION DEVELOPMENT PROGRAM—Model

tion in the school vision development program activities. For example, treatment of strabismus and amblyopia is beyond the scope of school-based visual activities. Clear criteria should exist for recognizing when children are not meeting the visual goals of the program and referral to outside optometrists specializing in vision therapy is indicated. In some instances, the outside optometrist may implement an office-based vision therapy program with the school resources used as one would home support. The school personnel will have more time, training, and resources than a parent and the environment may be more conducive to out-of-office support.

5. The school vision development program activities in this manual include the following recommendations:
   a. Ocular motility (Appendix IX) and bilateral integration activities to be given on a daily basis several minutes per day by the classroom teacher.
   b. Visual perceptual motor activities to be implemented by the physical education or classroom teacher.
      1. Example: Learning Breakthrough Program developed by Frank A. Belgau develops and refines the basic brain organizations that are the foundation of all learning. Equipment includes balance boards, bean bags, pendulum ball, visual motor control stick, ball toss back, target stand, and target pin set. Video and audio tape instructions for activities are used.
      2. Progress reviewed every four weeks.
   c. Binocular therapy, MUST be supervised by optometrist.
      1. Example: Home Vision support program (HTS) computerized orthoptics



SCHOOL VISION DEVELOPMENT PROGRAM—Model

program—30 min 3×/wk, 20–40 sessions, or until completed. Data reviewed every four weeks.

2. Brock string, lenses, flippers, prisms activities, etc. may be implemented.
3. Progress reviewed every four weeks.

d. Re-evaluation to include checklist and performance testing should take place every twelve weeks. Referrals for additional vision evaluation may be given at any time throughout the program.

6. Once vision skills have demonstrated adequate improvements, then a reading development program may be implemented. The reading development program can be implemented by a teacher or school aide. Depending on the school system, reading programs may already be implemented. Those computerized programs listed below may be supplemental and not necessarily replace the specific school reading program:
   a. Lexia—A computerized phonics-based reading software program. The educational content of the program was designed by Alice Garside, Ed.M. and former recipient of the Samuel T. Orton award, Pamela Hook, Ph.D., and Sharon Marsh, Ed.D. Lexia software meets the standards set forth in the recent National Research Council report, "Preventing Reading Difficulties in Young Children." Students are initially assessed using the Quick Reading Test (QRT) program which determines placement in the Lexia software program. Students can work independently on the computer to practice their skills with immediate feedback. Use Lexia 2–5/wk for 20 min/session.
   b. Pave—Perceptual Accuracy)Visual Efficiency—A computerized program developed by Taylor Associates (TA). Utilizes scanning and tachistoscopic flashes. Develops some aspects of visual/functional efficiency and perceptual accuracy—basic requisites for fluent silent reading and all learning and vocational needs. Use Pave 2–5/wk for 10 min/session.
   c. The Computerized Reading Placement Program (CPA) is given individually to each student for proper placement into the Reading Plus program. This individual one time assessment for placement in Reading Plus takes approximately 20–30 min.
   d. The Reading Plus program is a computerized program developed by Taylor Associates (TA) which utilizes reading passages presented at a controlled rate. This program helps to develop fluency (efficiency) resulting in ease and comfort, adequate reading rates and improved comprehension. Utilize Reading Plus 20–30 min sessions, 2–5 times/wk) for 40 sessions.
7. Additional comments
   a. *Communication between the optometric*

school consultant and school personnel is essential!

b. An example of how to incorporate the software is as follows:
   - Use HTS 3 days/wk for 30 min/day.
   - The other 2 days a week use PAVE for 10 min and Lexia for 20 min.
   - Once HTS is completed, then more time may be spent on the reading development software. Reading Plus is initiated once student has enough sight words (usually at 2nd grade level or higher) and shows improvement in Lexia.

NOTE: The information about various equipment and software programs described above is provided for informational purposes only and does not imply endorsement of any specific procedure or product by the authors or by the College of Optometrists in Vision Development.

APPENDIX I—BIBLIOGRAPHY

POLICY STATEMENTS, HANDBOOKS:

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Vision therapy; information for health care and other allied professionals. A joint organizational policy statement of the American Academy of Optometry, American Optometric Association, College of Optometrist in Vision Development, Optometric Extension Program Foundation. AOA, 1999.

The effects of vision on learning and school performance: a handbook for educators and parents. Produced by Children's Vision Committee of the Oregon Optometric Association. 1992.

A nurse's guide to children's vision & learning. American Foundation for Vision Awareness (AFVA). AOA.

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APPENDIX II—RESOURCES

ORGANIZATIONS:

American Foundation for Vision Awareness (AFVA)
243 N. Lindbergh Blvd.
St. Louis, MO 63141
Telephone: 1-800-927-2382
Website: *www.afva.org*
Email: afva@aol.com
Non-profit organization involved in publication of education materials and funding research grants in support of children's vision.

American Optometric Association (AOA)
243 N. Lindbergh Blvd.
St. Louis, MO 63141
Telephone: 1-314-991-4100
Fax: 1-314-991-4101
Website: *www.aoanet.org*
National professional organization for optometrists, reference materials available.

College of Optometrists in Vision Development (COVD)
243 N. Lindbergh Blvd., #310
St. Louis, MO 63141
Telephone: 1-888-268-3770
Fax: 1-314-991-1167
Website: *www.covd.org*
Certifies optometrists in vision development and therapy. Referral for optometrists providing vision therapy and functional vision care.

Optometric Extension Program
1921 E. Carnegie Ave., Ste 30L
Santa Ana, CA 92795
Telephone: 949-250-8070
Fax: 949-250-8157
Website: *www.oep.org*
Literature and supplies available.

Parents Active for Vision Education (P.A.V.E.)
4135-54th Place
San Diego, CA 92105-0084
Telephone: 619-287-0081
Fax: 619-287-0084
Website: *www.pave:eye.com/vision*
Email: vision@pave-eye.com
Parent support group for vision education.

SEE TO LEARN Children's Vision Program
Eye Care Council
Telephone: 1-800-960-EYES
Website: *www.seetolearn.com*
Email: eccstl@cjnetworks.com
Preventive health care organization which provides innovative education about vision care.

SCHOOL VISION SCREENINGS

American Optometric Association. "A School Nurse's Guide to Vision Screening and Ocular Emergencies." AOA.

"Guideline for School Vision Screening Programs"—Adolf Coors Foundation
Colorado Dept. of Health, Community Nursing Section
Attn: Karen Conner, RN
4300 Cherry Creek Drive So.
Denver, CO 80222
Telephone: 303-692-2357
School vision screening guidelines for Colorado

Cohen AH, Lieberman S, Stolzberg M, Ritty JM. The NYSOA vision screening battery—a total approach. *J Am Optom Assoc.* 1983;54(110:979–984). Available from Bernell Corporation.
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COVD checklist.

SUPPLIES

Bernell Corporation/Vision Training Products
4016 N. Home St.
Mishawaka, IN 46545
Telephone: 1-800-348-2225
Fax: 219-259-2102
Vision screening equipment available.

Computer Orthoptics/Home Therapy System.
21444 Hague Road
Noblesville, IN 46060
Telephone: 1-888-810-3937
Fax: 317-984-9661
E-mail: hometherapyinc@worldnet.att.net
Computerized binocular vision therapy system.

Lexia Learning Systems, Inc.
11A Lewis Street
PO Box 466
Lincoln MA 01773
Telephone: 800-435-3942 or 781-259-8752

Fax: 781-259-1349
Email: info@lexialearning.com
Computerized phonics based reading software program.

Learning Breakthrough Program by Frank A. Belgau.
Balametrics, Inc.
PO Box 2716
Port Angeles, WA 98362
Telephone: 360-452-2842
Email: balamet@olympus.net
Sensory motor program.

Taylor Associates/Communications, Inc.
200-2E. 2nd St.
Huntington Station, NY 11746
Telephone: 1-800-READ-PLUS
Fax: 516-549-3156
E-mail: info@ta-comm.com
Visagraph and Reading Plus software available.

APPENDIX III—Vision, Learning and Dyslexia A Joint Organizational Policy Statement

American Academy of Optometry
American Optometric Association

VISION AND LEARNING

Many children and adults continue to struggle with learning in the classroom and the workplace. Advances in information technology, and its expanding necessity and accessibility are placing greater demands on people for efficient learning and information processing.[1,2]

Learning is accomplished through complex and interrelated processes, one of which is vision. Determining the relationships between vision and learning involves more than evaluating eye health and visual acuity (clarity of sight). Problems in identifying and treating people with learning-related vision problems arise when such a limited definition of vision is employed.[3]

This position statement addresses these issues, which are important to individuals who have learning-related vision problems, their families, their teachers, the educational system, and society.

POLICY STATEMENT

People at risk for learning-related vision problems should receive a comprehensive optometric evaluation. This evaluation should be conducted as part of a multi-disciplinary approach in which all appropriate areas of function are evaluated and managed.[4]

The role of the optometrist when evaluating people for learning-related vision problems is to conduct a thorough assessment of eye health and visual functions, and communicate the results and recommendations.[5] The management plan may include treatment, guidance, and appropriate referral.

The expected outcome of optometric intervention is an improvement in visual function with the alleviation of associated signs and symptoms. Optometric intervention for people with learning-related vision problems consists of lenses, prisms, and vision therapy. Vision therapy does not directly treat learning disabilities or dyslexia.[6,7] Vision therapy is a treatment to improve visual efficiency and visual processing, thereby allowing the individual to be more responsive to educational instruction.[4,8] It does not preclude any other form of treatment and should be part of a multidisciplinary approach to learning disabilities.[6,7]

PERTINENT ISSUES

Vision is a fundamental factor in the learning process. The three interrelated areas of visual function are:

1. Visual pathway integrity including eye health, visual acuity, and refractive status;
2. Visual efficiency including accommodation (focusing), binocular vision (eye teaming), and eye movements;
3. Visual information processing including identification and discrimination, spatial awareness, memory, and integration with other senses.

To identify learning-related vision problems, each of these interrelated areas must be fully evaluated.

Educational, neuropsychological, and medical research has suggested distinct subtypes of learning difficulties.[9,10] Current research indicates that some people with reading difficulties have coexisting visual and language processing deficits.[11] For this reason, no single treatment, profession, or discipline can be expected to adequately address all of their needs.

Unresolved visual deficits can impair the ability to respond fully to educational instruction.[12,13] Management may require optical correction, vision therapy, or a combination of both. Vision therapy, the art and science of developing and enhancing visual abilities and remediating vision dysfunctions, has a firm foundation in vision science, and both its application and efficacy have been established in the scientific literature.[14–17] Some sources have erroneously associated optometric vision therapy with controversial and unfounded therapies, and equate eye defects with visual dysfunctions.[18–21]

The eyes, visual pathways, and brain comprise the visual system. Therefore, to understand the complexities of visual function, one must look at the total visual system. Recent

research has demonstrated that some people with reading disabilities have deficits in the transmission of information to the brain through a defective visual pathway. This creates confusion and disrupts the normal visual timing functions in reading.

Visual defects such as a restriction in the visual field of view can have a substantial impact on reading performance.[26] Eye strain and double vision resulting from convergence insufficiency can also be a significant handicap to learning.[27] There are more subtle visual defects that influence learning, affecting different people to different degrees. Vision is a multifaceted process and its relationships to reading and learning are complex.[28–29] Each area of visual function must be considered in the evaluation of people who are experiencing reading or other learning problems. Likewise, treatment programs for learning-related vision problems must be redesigned individually to meet each person's unique needs.

SUMMARY

1. Vision problems can and often do interfere with learning.
2. People at risk for learning-related vision problems should be evaluated by an optometrist who provides diagnostic and management services in this area.
3. The goal of optometric intervention is to improve visual function and alleviate associated signs and symptoms.
4. Prompt remediation of learning-related vision problems enhances the ability of children and adults to perform to their full potential.
5. People with learning problems require help from many disciplines to meet the learning challenges they face. Optometric involvement constitutes one aspect of the multidisciplinary management approach required to prepare the individual for lifelong learning.

This Policy Statement was formulated by a Task Force representing the College of Optometrists in Vision Development, the American Optometric Association, and the American Academy of Optometry. The following individuals are acknowledged for their contributions:

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APPENDIX IV— VISION THERAPY: Information for Health Care and Other Allied Professionals

A Joint Organizational Policy Statement of the American Academy of Optometry and the American Optometric Association

INTRODUCTION

Society places a premium on efficient vision. Schools and most occupations require increasing amounts of printed and computer information to be handled accurately and in shorter periods of time. Vision is also a major factor in sports, crafts, and other pastimes. The efficiency of our visual system influences how we collect and process information. Repetitive demands on the visual system tend to create problems in susceptible individuals. Inefficient vision may cause an individual to slow down, be less accurate, experience excessive fatigue, or make errors. When these types of signs and symptoms appear, the individual's conscious attention to the visual process is required. This, in turn, may interfere with speed, accuracy, and comprehension of visual tasks. Many of these visual dysfunctions are effectively treated with vision therapy.

PERTINENT ISSUES

Vision is a product of our inherited potentials, our past experiences, and current information. Efficient visual functioning enables us to understand the world around us better and to guide our actions accurately and quickly. Age is not a deterrent to the achievement of successful vision therapy outcomes.

Vision is the dominant sense and is composed of three areas of function:

- Visual pathway integrity including eye health, visual acuity, and refractive status
- Visual skills including accommodation (eye focusing), binocular vision (eye teaming), and eye movements (eye tracking)
- Visual information processing including identification, discrimination, spatial awareness, and integration with other senses

Learning to read and reading for information require efficient visual abilities. The eyes must team precisely, focus clearly, and track quickly and accurately across the page. These processes must be coordinated with the perceptual and memory aspects of vision, which in turn must combine with linguistic processing for comprehension. To provide reliable information, this must occur with precise timing. Inefficient or poorly developed vision requires individuals to divide their attention between the task and the involved visual abilities. Some individuals have symptoms such as headaches, fatigue, eyestrain, errors, loss of place, and difficulty sustaining attention. Others may have an absence of symptoms due to the avoidance of visually demanding tasks.

VISION THERAPY

The human visual system is complex. The problems that can develop in our visual system require a variety of treatment options. Many visual conditions can be treated effectively with spectacles or contact lenses alone; however, some are most effectively treated with vision therapy.

Vision therapy is a sequence of activities individually prescribed and monitored by the doctor to develop efficient visual skills and processing. It is prescribed after a comprehensive eye examination has been performed and has indicated that vision therapy is an appropriate treatment option. The vision therapy program is based on the results of standardized tests, the needs of the patient, and the patient's signs and symptoms. The use of lenses, prisms, filters, occluders, specialized instruments, and computer programs is an integral part of vision therapy. Vision therapy is administered in the office under the guidance of the doctor. It requires a number of office visits and depending on the severity of the diagnosed conditions, the length of the program typically ranges from several weeks to several months. Activities paralleling in-office techniques are typically taught to the patient to be practiced at home to reinforce the developing visual skills.

Research has demonstrated vision therapy can be an effective treatment option for:

- Ocular motility dysfunctions (eye movement disorders)
- Non-strabismic binocular disorders (inefficient eye teaming)
- Strabismus (misalignment of the eyes)
- Amblyopia (poorly developed vision)

- Accommodative disorders (focusing problems)
- Visual information processing disorders, including visual-motor integration and integration with other sensory modalities

SUMMARY

Vision therapy is prescribed to treat diagnosed conditions of the visual system. Effective therapy requires visual skills to be developed until they are integrated with other systems and become automatic, enabling individuals to achieve their full potential. The goals of a prescribed vision therapy treatment regimen are to achieve desired visual outcomes, alleviate the signs and symptoms, meet the patient's needs, and improve the patient's quality of life.

This Policy Statement was formulated by a working group representing the American Academy of Optometry, American Optometric Association, the College of Optometrists in Vision Development, and the Optometric Extension Program Foundation. The following individuals are acknowledged for their contributions:

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American Optometric Association, June 22, 1999
College of Optometrists in Vision Development, June 25, 1999
Optometric Extension Program Foundation, June 25, 1999

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APPENDIX V—RESOLUTION ADOPTED AT THE NATIONAL PTA CONVENTION June 1999

LEARNING RELATED VISION PROBLEMS EDUCATION AND EVALUATION

Whereas, It is estimated that more than 10 million children (ages 0 to 10) suffer from vision problems; and

Whereas, Many visual skills are necessary for successful learning in the modern classroom; and skill deficiencies may contribute to poor academic performance; and

Whereas, Typical "vision" evaluations/screenings only test for a few of the necessary learning related visual skills (distance acuity, i.e. 20/20 eyesight, stereo vision, and muscle balance), leaving most visual skill deficiencies undiagnosed; and

Whereas, Learning related vision problems, when accurately diagnosed, can be treated successfully and permanently; and

Whereas, Knowledge regarding the relationship between poorly developed visual skills and poor academic performance is not widely held among students, parents, teachers, administrators and public health officials; now therefore be it

Resolved, That National PTA, through its constituent organizations, provide information to educate members, educators, administrators, public health officials and the public at large about learning related visual problems and the need for more comprehensive visual skill tests in school vision screening programs performed by qualified and trained personnel; and be it further

Resolved, That National PTA, through its constituent organizations, urge schools to include in their vision screening programs tests for learning-related visual skills necessary for success in the classroom.

APPENDIX VI – Coors Checklist

SAMPLE FORM

NAME: _____ GRADE: _____ DATE: _____
SCHOOL: _____ TEACHER: _____

ABC CHECKLIST FOR VISION
OBSERVATION AND HISTORY

Please check appropriate items and return to the school registered nurse for review and determination of action to be taken.

APPEARANCE–Do eyes look normal?

____ Eyes turn in or out
____ Crusty or red eyelids
____ Different size pupils or eyes
____ Swelling of eyelids
____ Conjunctivitis (Pink eye)
____ Drooping lids
____ Other: _____

BEHAVIOR–Teacher/Parent Observation

____ Tilts head, covers or closes one eye for critical seeing
____ Difficulty in keeping place while reading – a "finger" reader
____ Disinterested in activities involving critical seeing
____ Excessive stumbling, awkwardness or daydreaming
____ Holds printed materials in unusual position
____ Other: _____

COMPLAINTS–Child's Statements

____ Eyes hurt or blur while reading
____ Headaches when reading
____ Words move or jump about when reading
____ Double vision
____ Eye problem following blow to head
____ Can't see the chalkboard
____ Other: _____

APPENDIX VII – Vision Symptom and Performance Checklist

NAME: _____ DATE: _____

Check the column which best represents the occurrence of each symptom.

Examination Number: _____

	Never	Seldom	Occasional	Frequently	Always
Blur when looking at near					
Double vision					
Headaches with near work					
Words run together reading					
Burn, itch, watery eyes					
Falls asleep reading					
Sees worse at the end of the day					
Skips/repeats lines reading					
Dizzy/nausea with near work					
Head tilt/close one eye when reading					
Difficulty copying from chalkboard					
Avoids near work/reading					
Omits small words when reading					
Writes up/down hill					
Misaligns digits/columns of numbers					
Reading comprehension down					
Poor/inconsistent in sports					
Holds reading too close					
Trouble keeping attention on reading					
Difficulty completing assignments on time					
Always says "I can't" before trying					
Avoids sports/games					
Poor hand/eye (poor handwriting)					
Does not judge distance accurately					
Clumsy, knocks things over					
Does not use his/her time well					
Does not make change well					
Loses belongings/things					
Car/motion sickness					
Forgetful/poor memory					

OTHER COMMENTS:

APPENDIX VIII – Pave Checklist

PARENTS ACTIVE FOR VISION EDUCATION (P.A.V.E.)

Research has shown that over 80% of the information in the classroom comes in through the visual system. The American Optometric Association lists the following guidelines to assist in recognizing visual problems which affect learning.

__ skips or rereads words
__ loses place while reading
__ covers or closes one eye
__ moves head while reading
__ tilts head to one side
__ holds reading close
__ frowns or squints
__ writes or prints poorly
__ rubs or blinks eyes
__ tires easily in school
__ headaches with near work
__ blurred vision
__ double vision
__ avoids near work
__ poor general body coordination
__ poor eye-hand coordination
__ does not complete assignments
__ low frustration level with near work
__ reverses letters or words
__ difficulty understanding written instructions
__ difficulty understanding math concepts
__ eye discomfort
__ motion or car sickness
__ crossed or wandering eye

Any of the above signs may indicate a possible visual problem. Several checks strongly indicate a visual problem. It is important that if professional help is sought, care is given by a qualified eye doctor. Not all eye doctors are trained in developmental vision. Following are some questions to ask to see if the eye doctor is qualified. These questions were compiled by the Temple City High School Parent-Teacher Association.

1. Do you make a full series of near-point tests?
2. Do you make academically related visual perception tests?
3. Do you provide vision care in your office for children who are having learning problems, or will you refer to someone who specializes?
4. Will we get a written report that all adults concerned can understand and apply to assist this child?
5. Will you see this child again during the school year to ascertain his/her progress?

APPENDIX IX— "DAILY ACTIVITIES"

The following activities may be implemented in small groups of students or individually with the teacher/aide.

Wide Eye Stretches/Calisthenics

Description and Set-up: Have the student look as far to the right as possible and hold in that position for several seconds. Then have the student look to the left, again holding for five seconds. Continue with looking up, down, and in oblique locations. Try to have the student "stretch" as far as possible. It may be uncomfortable at first, but improves with time and practice. The student should do these calisthenics at least twice a day for several minutes each time.

Eye Tracking (Pursuits)

1. Description and Set-up: Use a small hand-held object or finger puppet. Pursuit procedures may be given with the student lying down, seated or standing, whichever posture is the most comfortable initially. The student should keep his head still, as these are eye movements, not "head" movements. Hold the puppet directly in front of the student's nose, approximately fourteen–sixteen inches from the students face. The teacher/aide should slowly move the puppet in all directions, starting with horizontal movements then vertical movements and diagonal movements. The pursuits pattern should resemble a star. Now move the object in a circular fashion. In the event of restriction of ocular movement, ocular discomfort, double vision or nausea, the Optometric School Consultant should be consulted immediately.

2. Description and set-up: Cover one eye. Perform the activity with the right eye first and then the left eye. Student should stand with good posture. Have the student extend his right arm with his thumb sticking up. The rest of the hand is in a fist. The student rotates his arm in a circle, with the center of the circle located even with the student's nose and about two feet in diameter. If it is too difficult for the student to rotate his thumb, the teacher/aide may assist him in rotation of his thumb. As the student improves his ability, the teacher/aide can begin asking the student questions such as: What color is the carpet? How many chairs are in the room? Can you feel your eyes moving? Do they feel like they are tracking your thumb accurately? Is it difficult to use your side vision when you are focusing on your thumb? Why do you think so? Can you think of anything in your daily life that this skill might help you do better?

Saccades/Fixations

Equipment: Two different colored pens or two different objects such as hand-held puppets.

Description and Set-up: Hold the pens or objects approximately 14–16 inches from the student's face and about 10 inches apart. Call out the color or name of one of the objects. Have the student look at the one you called and to continue looking at that pen until you call out the second color. The student should then look to the second pen. Continue calling each pen, while you periodically change the location of one of the pens, so as to have the student fixate in all fields of gaze. The student should maintain fixation on the object requested by the teacher/aide, and should not be distracted, anticipate, nor take several jumps to locate the object. When proficient with stationary targets, advance to moving targets, changing the distance between them.

Cross Marches

Description and setup: Have student stand up. The student should raise his right leg to meet his left hand, then the left leg is raised to meet the right hand. Continue alternating legs, like you're "marching". This pattern of coordinated movement allowing the leg on one side of the body to touch the opposite hand helps with bilateral integration, crossing the body's midline.

Article

School Vision Programs—Current Updates

Lynn Fishman Hellerstein, OD, FCOVD, FAAO

There have been numerous school-based vision programs across the country where optometrists have been consulting and implementing vision screening and treatment strategies within the school setting or with direct referral to optometric offices. Many of these programs were not initiated as research projects, therefore the data obtained may not withstand scientific scrutiny. However, these programs have been crucial by providing the optometrist experiences within the school system, thereby laying the foundation for future school-based vision programs. Many obstacles present when working within the school, such as frequent student turnover, change in student scheduling, school vacations, financial woes, etc. Thus strategies to combat these obstacles need continually to be evaluated.

Several of these programs are presented below. Many of these programs are currently in process, therefore data may be preliminary.

KANSAS

Introduction

During the 1998 session, the Kansas Legislature appropriated $27,000 for the Kansas Optometric Association (KOA) to conduct research on the links between the treatment of vision problems and reading performance for Kansas students. Based on the outcome of this research, the Legislature appropriated $250,000 for the KOA to expand the study to include additional conditions and more children. Phase I preliminary results are presented below and Phase II is currently underway.

Methods

The effectiveness of optometric vision therapy in improving the reading skills of third-grade students with convergence insufficiency was investigated. More than 500 third-grade students with reading problems were screened by optometrists and staff members in cooperation with elementary principals, teachers, and school nurses between fall 1998 and spring 1999. The screened battery consisted of the New York State Optometric Association protocol. Serious vision problems that could hinder learning were identified in more than half of the students screened. Of these, about 40% had convergence insufficiency. Fifty-six of the students identified participated in the study (27 in control group, 29 in the treatment group). Subjects in the treatment group received 15 weeks of optometric vision therapy.

Results

Subjects in the treatment group doubled their ability to converge ($P < .0001$). More im-

portantly, reading skills for subjects in this group improved one entire grade level from pre-treatment to post-treatment ($P < .0085$). There was also a 15% increase in reading comprehension ($P < .0007$). These improvements did not occur for the subjects in the control group.

Conclusion

With the encouraging results from Phase I, Phase II of the project was initiated. Phase II evaluates the effectiveness of optometric vision therapy in improving reading skills of third-grade students with convergence insufficiency, convergence excess, accommodative insufficiency, and ocular motor dysfunction. The New York State Optometric Association Vision Screening Battery was used for vision screening. In addition, pre- and post-treatment reading and Visagraph tests will be used to measure changes in reading performance. Preliminary results from Phase II are expected in Summer 2001.

COLORADO

Introduction

A school-based vision program (pilot program) was administered to two third-grade tracks (49 students) at an elementary school in Aurora, CO (1/00–5/00). The program consisted of in-depth vision screening, reading evaluation, and administration of a school-based vision program. This study was funded by the William B. O'Rourke Foundation. Consulting optometrists were Drs. Jeri Schneebeck and Lynn Fishman Hellerstein.

Methods

Optometrists, staff, and school personnel visually screened all 3rd grade children in a school using a vision screening comprised of tests from the New York State Optometric Association Screening, Visagraph evaluation, Development Eye Movement Test (DEM) test, and quality of life checklist. Those children who have visual problems were identified and referred for outside vision evaluations and/or school based vision and reading program.

The school-based vision program consisted of ocular motility activities in the classroom, bilateral integration activities in gym class, and binocular computerized program (Home Therapy System). The reading development program consisted of software programs: Lexia, PAVE, Reading Plus. Utilizing a school aide with optometric supervision, the program was given daily for 40 minutes for 3½ months.

Results

Significant findings ("E" = experimental group, "C" = control group):

a. Visagraph grade equivalent-post test difference (.001 level) between "E" (2 y. increase) & "C" (<1 y. decrease)
b. Visagraph fixations (.03 level) reduction in fixation in "E" group pre-post test, "C" group insignificant change
c. VA distance improvement in "E" group (.03 level), "C" group insignificant change
d. VA near improvement in "E" group (.03 level), "C" group insignificant change

Both groups improved in reading comprehension ("E" group improved 13%, "C" group improved 11%). There was no significant difference between 2 groups. Both groups improved on DEM, no significant differences between groups. The quality of life checklist data was inconclusive as there was a significant difference in pre-measurements between the two groups, indicating that either the groups were not equally matched in symptoms or that the observers using the checklist interpreted symptomology/checklist differently. Of the "E" group, 34.7% was referred for a visual examination.

Forty-three percent of 3rd graders failed the accommodative rock test. Referral was not made on failure of accommodative rock test alone, due to school's concerns of over-referrals. These children should be monitored carefully and referred throughout the program if appropriate progress is not made. A future study may need to be considered regarding the children not passing the accommodative testing.

Both groups improved on Cherry Creek reading test; no significant difference between groups. It was interesting to note that Arrowhead had an unusually high number of students who place in advanced proficiency level on CSAP testing. With no explanation available, the principal thought the possible increase could be due to enhancement of good readers through vision pilot program?

Conclusion

Student and teacher input indicated that confidence, reading ability, and reading enjoyment were impacted in a positive way. "Reading enjoyment translates into additional reading time!" stated the principal at the school. The study had to be discontinued because of reorganization of student class placement for the following year. The study was scheduled to for one full year. The school has elected to continue this program at their own expense on current 3rd grade students.

CALIFORNIA

The Effect of Low Plus Lenses on Visual Perception, by Drs. Robert L. Severton and W.C. Maples.

Introduction

An ongoing vision science debate is whether vision skills deficits impact academic performance. Some contend that the proper near point lenses, regardless of measured refractive error, aid individuals in near point tasks such as reading. Pierce and Greenspan have demonstrated near point lens efficacy when proper posture is maintained. The "correct" near prescription was obtained by near point retinoscopy.

Vision perception is considered to be a major factor in overall academic performance, particularly in the early years. The Frostig Developmental Test of Visual Perception (Frostig Test) measures visual perceptual skills of young children (ideally, 4 to 8 years). This test divides visual perception into five different components:

1. Eye-Motor Coordination: Eye hand coordination measured by drawing lines between boundaries.
2. Figure-Ground: Figures are embedded in increasingly complex grounds.
3. Constancy of Shape: Recognition test based on recognition of geometric figures which have been changed in some way (size, shade, texture, position in space, etc.).
4. Position in Space: Rotations/reversals presented in series.
5. Spatial Relationships: Analysis of forms and patterns using lines and angles which the subject is to copy.

Each test component raw score is converted into an age equivalent score or perceptual age from a normative table which was developed for each particular chronological age. This test therefore compensates for age at any age the child is tested.

The research question was, "Do near point lenses, worn properly, actually change the visual perceptual scores of young children as measured by the Frostig Test?"

Methods

Children in the first grade of a private parochial school in southern California were administered the Frostig Test of Visual Perception (pre-test) by a reading teacher who had qualified as an administrator of the test. A modified Orinda visual screening was administered by an optometrist (RLS). This screening included visual acuity far and near, cover test far and near, near point of convergence, ophthalmoscopy, distance retinoscopy and near retinoscopy. Thirty subjects who passed the screening test were selected at random for the study. Ten subjects were then randomly placed in three groups, regardless of the visual screening findings. These three groups were:

A. Plus Lens Group (+0.75D OU) (Experimental)
B. Plano Lens Group (Control: Placebo)
C. No Lens Group (Control: Non-placebo)

Lenses were dispensed in identical frames. Only the optometrist knew which of the children were dispensed the plus lenses and which received the plano lenses. The children who were prescribed the +0.75D spheres and plano spheres wore them for all their classroom activities during the spring semester for approximately five months. The Frostig test was then administered to each subject (post-test) by the same Frostig Test tester who had administered the pre-test.

Results

The pre-test perceptual scores were compared to one another by a student *t*-test. There was not a significant perceptual difference between any of the groups on the pre-test score analysis.

The pre- and post-Frostig Test means for each group were compared. The post-test-plus-lenses group was significantly higher than the

pre-test score. The plano lenses group and the no lens group were not significantly different from one another. There was a statistically significant increase in the visual perceptual scores between the pre- and post-test for the experimental group, but not for the two control groups. The sum growth of the experimental group was 84 points (mean 8.4), while the two control groups were almost identical at 37 (plano lens; mean 3.7) and 38 (no lens; mean 3.8) points.

Conclusions

Plus lenses (+0.75D spheres) significantly improved the perceptual skills of first-grade children. This significant difference in the mean between pre- and post- for this group was the only significant improvement. Data and references are available from the authors by request.

LOUISIANA

Statistical Analysis of the 100 Consecutive Cases, by Drs. H.B. Hewett and W.C. Maples.

Introduction

These patients all received 50 hours of optometric vision therapy. A retrospective study was done to determine the following areas of performance changes in:

1. Oral Reading Comprehension (Gilmore Oral Reading Test C).
2. Oral Reading Accuracy.
3. Silent Reading Vocabulary (Gates-MacGinitie Reading Test).
4. Silent Reading Comprehension.

Methods

The pre-test scores were added to the number of months the child was in therapy to the score so that, assuming that no care would have been given, this would represent normal reading growth of the average child. The mean of this adjusted pre-test score was compared to the post-test score.

Results

The following are the results of this statistical analysis, using the student *t* test.

	Mean Pre-Test	Adjusted Mean Post-Test Adjusted	*P* value
Oral Reading			
Comprehension	5.9486	6.9486	<.001
Accuracy	4.4597	4.8154	<.001
Silent Reading			
Vocabulary	4.2662	4.4420	.038
Comprehension	3.9063	4.4133	<.001

Conclusions

These results are very favorable, indicating a significant improvement in oral and silent reading when comparing pre- and post-reading scores.

SUMMARY

The preliminary results from the preceding studies are encouraging, as these studies have provided valuable data, experience, and feedback to and from the educators. These studies promote questions for future research:

1. What is the appropriate length of time for a school-based vision program?
2. How can we impact the most children with the most cost-effective program?
3. The position of "School Optometric Consultant" needs to be established to meet the demands of continuing requests. What is the most appropriate method to establish this position? How can we convince more educators of the importance of such a position?

More optometrists will be needed to work with school systems, and therefore, more educational training for optometrists is needed. COVD continues to maintain its high standards in assisting its members in providing the highest level of vision care. COVD welcomes your comments and continued support in this area.