

## **Improving the Vision of Our Children**

Julie A. Hanson, B.S., 4th Year Intern  
Michigan College of Optometry

Daniel N. Wrubel, O.D., Professor  
Michigan College of Optometry  
Project Supervisor

## **Improving the Vision of Our Children**

Public awareness of early testing and intervention involved in the vision care of young children needs to be increased. In order to do so the Children's Vision Care Task Force was assembled as a sub-committee of the Michigan Optometric Association (MOA). The education of optometrists, ophthalmologists, pediatricians, family physicians, school nurses, teachers, parents, and community organizations will help to improve the overall vision care of our children.

There are approximately 35,886,000 children in the United States between ages of five and thirteen. Over eighteen million have not had their eyes examined. Research indicates that fourteen percent of three year olds have vision problems and up to forty percent of children will have problems by high school graduation. Twenty percent of children ages nine through fifteen need glasses and ninety percent of them have not received them.<sup>1</sup> Fewer than fifteen percent of all preschool children receive a comprehensive eye examination and fewer than twenty percent of all preschool children receive some type of vision screening.<sup>2</sup> These are astounding statistics, and should make us aware children are not receiving the vision care that is truly needed.

The following symptoms may indicate that a child has a vision problem. Physical clues include; red, sore, itching, watering, and swollen eyes. Also, reoccurring styes, jerky eye movements, one eye turning in or out, squinting, eye rubbing and excessive blinking. Commonly children will complain of words and lines running together, words jumping, headaches, dizziness, blurred vision, double vision and sensitivity to light and nausea after reading. Others may notice head tilting, closing or blocking one eye when

reading, difficulty noticing objects at a distance and difficulty following a moving object.<sup>3</sup>

Performance clues may include; avoidance of near work, frequent loss of place, confusion of similar looking words, failure to recognize the same word in the next sentence, poor reading comprehension, and letter or word reversals after first grade. The child may also show signs of difficulty copying from the chalkboard, poor handwriting, misaligning numbers, holding books too close or too far from the eyes, and omitting, inserting, or rereading letters or words. Another common sign is inconsistent or poor sports performance.<sup>3</sup>

Secondary symptoms may also include; good in everything but school, low self-esteem, poor self-image, temper flare-ups, aggressiveness, frequent crying, short attention span, fatigue, frustration, stress, irritability, and daydreaming. They may be labeled as lazy, dyslexic, attention deficit disorder, slow learner, behavioral problems, juvenile delinquent, or working below potential.<sup>3</sup>

The above symptoms may be vision related and are frequently early complaints of a child with vision difficulties. Parents, teachers, and other adults that work close with children can help to watch children for these symptoms to refer them for appropriate care. Early intervention is the key to avoid long lasting deficits in the child's vision and to prevent the child from falling behind in school.

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. Problems in identifying and treating people with learning-related vision problems arise when such a limited definition of vision is employed.<sup>4</sup> People at risk for learning-related vision problems should receive a comprehensive optometric evaluation. The role of the optometrist should be to conduct a thorough assessment of eye health and visual functions, and communicate the results and recommendations. The management plan may include treatment, guidance, and appropriate referral. 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, but vision therapy is a treatment to improve visual efficiency and visual processing, thereby allowing the individual to be more responsive to educational instruction.<sup>4</sup> The three interrelated areas of visual function are visual pathway integrity including eye health, visual acuity, and refractive status. Secondly, visual efficiency including accommodation (focusing), binocular vision (eye teaming), and eye movements and thirdly, visual information processing including identification and discrimination, spatial awareness, memory, and integration with other senses.<sup>4</sup>

Current research indicates that some people with reading difficulties have co-existing visual and language processing deficits. For this reason, no single treatment, profession, or discipline can be expected to adequately address all of their needs.<sup>4</sup> Unresolved visual deficits can impair the ability to respond fully to educational instruction.<sup>4</sup> 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.<sup>4</sup>

Visual defects such as a restriction in the visual field can have a substantial impact on reading performance. Eyestrain and double vision resulting from convergence insufficiency can also be a significant handicap to learning. There are more subtle visual defects that influence learning, affecting different people to different degrees. Vision is a multi-faceted process and its relationships to reading and learning are complex. Each area of visual function must be considered in the evaluation of people who are experiencing reading or other learning problems.<sup>4</sup> It has been shown that by improving visual skills, you can improve academic performance. Clearly academic performance is multi-faceted, but by improving visual acuity, ocular motor, binocular, accommodative, visual motor and visual perceptual skills the overall picture will only improve.<sup>5</sup>

A recent survey shows that most parents are not aware of the importance of a comprehensive eye exam, versus a screening.<sup>6</sup> The standard eye chart used in most screening can detect mainly myopia. A complete examination includes more than just how well the child is able to see. It should also include an assessment of the child's binocular status, the child's depth perception, color vision, muscle motility, sensory-motor development, and a full ocular health assessment-externally and internally. This comprehensive exam is necessary to detect hyperopia, astigmatism, and other conditions we know affect far more children. Visual screenings often do not take into account a child's ability to *sustain* single, clear, comfortable and efficient binocular vision on desktop tasks, like reading and writing. Indeed, there are very few adequate non-professional screening techniques that accurately reveal learning-related vision problems. It has been demonstrated that hyperopic children are more likely to have visual

perceptual problems and difficulty reading and it is well known that these children will pass most visual screenings.<sup>7</sup>

In the Orinda vision study the Modified Clinical Technique (MCT) was found to be the most effective screening procedure, finding nearly twice as many cases that needed referral as compared to the next best screening technique. The MCT consists of the following tests: visual acuity at twenty feet, cover test, retinoscopy, and indirect ophthalmoscopy.<sup>8</sup> This does not include the tests needed to evaluate a child's accommodation, tracking skills, visual processing, visual motor integration, and attention and memory skills that relate to vision. These tests that have been omitted are highly related to school performance, but are difficult and costly to include in a screening.

Currently in Michigan, state law requires vision screening as a mandatory service by the Public Health Code Act of 368 of 1978. Children are screened once between the ages of three and five years of age. School age children are to be screened in first, third, fifth, seventh, ninth, and eleventh grades. Screenings, based on the MCT, include an observation of the child's eyes for symptoms, a test for myopia and hyperopia. Eye alignment is also measured at distance for all ages, and at near for ninth and eleventh grades only.<sup>9</sup>

Amblyopia (decreased visual acuity in one eye) is a non-obvious disorder that afflicts two to five percent of children in the general population, or 75,000-200,000 preschoolers. Those children, if untreated, will be sixteen times more likely to go blind than non-amblyopic children. Further, amblyopia accounts for more loss of vision before age forty-five than all other ocular disease and trauma combined.<sup>2</sup>

Amblyopia, which commonly is detected in a screening, is generally detected too late in the child's life to make major corrections. Current standards of care for the treatment of amblyopia suggest that the outcome of therapy for strabismus (a major cause of amblyopia) is best if surgery and patching are instituted prior to age 24 months.<sup>10</sup> The prognosis for acuity improvement with patching is best between the ages of 18 months and 36 months and gradually lessens until difficult/limited improvement is noted after the age of 12. Another cause of amblyopia is congenital cataracts. Treatment (surgery, patching, and optical correction) is suggested to occur by 6 months to enhance the prognosis for good vision in the future.<sup>10</sup>

Former President Jimmy Carter has personally taken this problem on as a crusade of his own. His granddaughter Margaret suffered from strabismus, and her parents noticed that by the time she was three years old she often tilted her head to the side, attempting to favor one good eye. But her problem was not understood until she injured her eye by accidentally sticking a butter knife in it, not able to see it when it approached her eye. When she was taken to a doctor, a thorough test revealed that she had little reaction to source of light. Early treatment, which included a combination of vision therapy and patching, corrected her amblyopia.<sup>11</sup>

A more serious case was with their grandson Jamie, who, at eight years old had no noticeable symptoms and had passed several eye tests administered in school. When he finally failed one of the school eye exams, his parents took him to an optometrist, who diagnosed a serious and advanced case of amblyopia. The doctor advised that it might be too late to correct Jamie's eyesight completely but prescribed therapy and a rigid

discipline of a patch over the good eye for several hours each day. His vision has now improved with glasses to 20/60, and they are hopeful that his problem will be further improved. Jamie's parents feel strongly about the importance of children being tested in an optometrists' office long before they start school in order to expose strabismus. This shows that amblyopia can affect all people, of all walks of life. President Carter favors legislation in all states mandating comprehensive eye exams before entering kindergarten and his wife and him are co-chair persons of Operation Bright Start, which gives examinations free of charge to children under the age of one.<sup>11</sup> President Carter's influence has already begun a campaign to provide eye care to all infants regardless of a parent's ability to pay, in order to prevent amblyopia.

There are sensitive periods in a child's development; therefore there is a great need for an assessment of eye and vision development *during the first year of life*. Many eye health conditions are also more responsive to treatment when diagnosed before additional complications arise. Vision is one of the primary sensory modalities for conceptual development in infants. All eye and vision conditions must be diagnosed and managed at the earliest possible age in order to maximize visual development and to reduce the incidence of permanent visual impairment.<sup>10</sup> The first examination is recommended for the child with no risk factors by the age of six to eight months, and then again at around three years of age or as needed, and annually or as recommended. The first examination for the child at risk is anywhere from birth to six months of age, then as recommended.<sup>12</sup>

A high-risk infant is one that is born prematurely, has low birth weight, was given oxygen at birth, or has a family history of a visual defect such as retinoblastoma,



congenital cataracts, metabolic or genetic disease, amblyopia and strabismus. Prenatal health factors such as a mother's nutrition, infections such as rubella, venereal disease or sexually transmitted diseases the mother had, drugs she took, and teratogens she may have encountered can greatly affect the child's visual development. A difficult or assisted labor which may be associated with fetal distress and/or low Apgar scores, and any child with a diagnosed genetic anomaly such as Down Syndrome, Fragile X Syndrome, or those with major motor anomalies such as cerebral palsy is also at high risk. Hearing, physical, mental, or emotional impairments may also have a direct effect on vision.<sup>10</sup>

A few helpful hints for the parent of an infant are to know the child's family history of eye and health related diseases before the exam. Also, the parents should write down any questions they have beforehand to help with remembering them, schedule an appointment when the child is most cooperative, and bring familiar toys to help keep the child's attention. These will help the exam run more smoothly and make the first experience of the child in the optometrist's office a pleasant one.

There are many ways to help a baby's visual development. Infants are not born with perfect vision, as they grow they develop it through a learned process. Suggestions available from the College of Optometrists in Vision Development (COVD) are age specific to help develop that vision. At one month a parent should hold and feel the infant from alternating sides to promote adequate visual development of both eyes, place the baby in his or her crib from different directions, periodically change the location of the crib so the infant can see the world from different viewpoints, hang a mobile off to

the side so that the baby can see it through the crib slits and change the position of that mobile every other day. At two months a parent should allow the baby to explore with his or her hands, provide stimuli of many different textures, sizes, weights, and forms, and place a lightweight rattle in your baby's hands and help him or her to shake it. At four months a parent should allow the baby to help hold the nursing bottle, and provide clean, smooth objects that can be explored with mouth and hands and start to play the "patty cake" game.<sup>13</sup>

A parent should play "peek-a-boo" to develop visual memory at six months. They should also move the crib mobile closer to your baby so it can be reached and hit to make it move, and also tie bells on booties so the infant can learn about his or her body through sound and movement. At eight months a parent should talk to your baby frequently so he or she can associate experiences with words and place objects on a highchair tray that can be pushed off and dropped to the floor. At ten to twelve months a parent should remember not to rush the baby into walking. Crawling on all fours is very important for developing coordination of the body, as well as the two eyes.<sup>13</sup>

A parent should also look for signs that the baby is able to follow an object with his or her eyes by five weeks, bring his or her hands together by eight weeks, hold and sustain direct eye contact by three months, turn his or her eyes together to locate near objects by four months, make the sounds p, b, t, d, and m by five months, roll over independently by seven months, sit without support by eight months, and creep and crawl by nine months. If any of these developmental milestones are slow in developing or lacking a parent should seek professional help from their pediatrician and optometrist.<sup>13</sup>

The vision of our children is everyone's responsibility. Increasing our awareness of the role vision plays will help to ensure that children receive the care needed when most appropriate. Increasing the standards of vision care for children will only help to improve their overall quality of life. Many organizations exist that are looking to help. These include Operation Bright Start, Parents Active for Vision Education (PAVE), College of Optometrists for Visual Development (COVD), Lion's clubs, American Foundation for Visual Awareness (AFVA), American Optometric Association (AOA) and Michigan Optometric Association (MOA).

Additional resources: Microsoft PowerPoint presentation "Improving our Children's Vision" and document "Performing a Pediatric Exam."

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## Bibliography

- <sup>1</sup> Children's Vision for the Primary Care Optometrist: AOA Congress. Continuing education. 2002.
- <sup>2</sup> School vision. American Optometric Association News. 2002 Oct 14; 41(7):9.
- <sup>3</sup> Parents Active for Vision Education. The hidden disability, undetected vision problems. Pamphlet #1250 1994.
- <sup>4</sup> Vision, Learning and Dyslexia: A Joint Organizational Policy Statement of the American Academy of Optometry and American Optometric Association. Journal of Optometric Vision Development. 1997; 28: 98-100.
- <sup>5</sup> W.C. Maples, O.D., M.S. Visual factors that significantly impact academic performance. Optometry. 2003; 74 (1):35-49.
- <sup>6</sup> VSP releases children's eye care survey. American Optometric Association News. 2002 May 27; 40 (22):9.
- <sup>7</sup> Merrill D. Bowan, O.D. Learning Disabilities, dyslexia, and vision: a subject review. A rebuttal, literature review, and commentary. Optometry. 2002; 73 (9): 553-75.
- <sup>8</sup> Peters et al. The Orinda Vision Study. American Journal of Optometry and Archives of American Academy of Optometry. 1959; 36:455-70.
- <sup>9</sup> Heard, Kathryn. B.A., MED. Fifty Years of Vision Screening In Michigan. Michigan Optometrist. 1993: Sept. 3-5.
- <sup>10</sup> Marsh-Tootle, Wendy L. OD, MS. Infants, Toddlers, and Children. Borish's Clinical Refraction. W.B Saunders and Company. 1998; p. 1060-1118.
- <sup>11</sup> Jimmy Carter: Crusades for improved Vision care. Optometric Management. 2002; 37 (11): 46-50.
- <sup>12</sup> AOA's Optometric Clinical Practice Guidelines. Pediatric Eye and Vision Examination. St. Louis: American Optometric Association, 1995.
- <sup>13</sup> Learning to See. College of Optometrists in Vision Development.  
[www.covd.org/od/see.html](http://www.covd.org/od/see.html)

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For more information contact:

American Foundation for Visual Awareness (AFVA)  
243 N. Lindbergh Blvd.  
St. Louis, MO 63141  
1-800-927-AFVA

American Optometric Association  
243 N. Lindbergh Blvd.  
St. Louis, MO 63141  
[www.aoa.net](http://www.aoa.net)

Colleges of Optometrists in Visual Development (COVD)  
243 N. Lindbergh Blvd.  
St. Louis, MO 63141  
1-888-COVD770  
[www.covd.org](http://www.covd.org)

Michigan Optometric Association  
530 W. Ionia St. Suite A.  
Lansing, MI 48933  
1-517-482-0616  
[www.mioptassn.org](http://www.mioptassn.org)

Operation Bright Start (OBS)  
1-877-OBS-EYES  
[www.operationbrightstart.com](http://www.operationbrightstart.com)

Parents Active for Vision Education (PAVE)  
9620 Chesapeake Drive, Suite 105  
San Diego, CA 92123  
1-800-PAVE-988

## Performing a Pediatric Exam

- I. Case History
  - A. Chief complaint from the parent and gather pertinent information, then begin the exam immediately to hold the child's attention.
  - B. Signs and Symptoms
  - C. Patient's medical history including allergies and medications
  - D. Pre- and perinatal history
  - E. Developmental history
  - F. Family history
  - G. History can be taken throughout the exam
  
- II. Visual Acuity
  - A. Important questions to ask yourself when testing are:
    - i. Can the child see what he/she needs to see for their age?
    - ii. Is the vision equal between the two eyes?
  - B. Ideal distance testing is no less than 10 feet.
  - C. Consider the child's age and work appropriately.
  - D. Letters, numbers, figures, and matching will all work.
  - E. Be Creative!
  - F. Don't spend too much time trying to teach the child how to take the test, have practice paper copies available for parents to teach the child at home for future visits.
  
- III. Ocular Alignment
  - A. Direct Observation
    - i. Does the patient look strabismic or not
    - ii. Have parents noticed strabismus
  - B. Cover test (and/or Herschberg, Krimsky, Bruckner)
    - i. Control fixation and accommodation
    - ii. Determine if strabismus is present or not
    - iii. Direction, Laterality, Frequency, and Amount
  - C. Stereopsis testing (Random Dot)
  - D. EOM's
  
- IV. Refractive Status
  - A. Approximate refractive error:
    - i. First year of life a healthy, full-term infant is expected to be hyperopic (approximately +2.00D)
    - ii. 3-5 year olds will normally have +.50D.
    - iii. 6-10 year olds should be plano.
    - iv. Premature children tend to have more myopia.

B. Determining refractive error:

i. Static Retinoscopy

1. Have the parent hold the child while the child is fixating on a distant object (puppet, video, lights, etc.).
2. If the child is able, ask questions about the target to make sure the child is paying attention to it.
3. Use retinoscopy lenses or loose lenses, but move quickly.

ii. Dynamic Retinoscopy

1. Consider doing book, bell, MEM, Stresspoint, or Mohindra.
2. Easier to control fixation
3. Use retinoscopy lenses or loose lenses, also need to be able to hold target, if needed.

iii. Important to determine that refractive error is equal in both eyes.

iv. Dependant upon age and maturity, a refraction using a phoropter is often impossible/difficult.

v. Autorefractor can be used for conformation purposes.

vi. Cycloplegic refraction

1. 1% cyclopentolate, topical anesthetic first if possible
2. Have parent hold child to instill the drops or have child lay on back on floor and place drops in nasal canthus and allow child to blink the drops in if having a difficult time
3. Determines true refractive error
4. Essential on all eso deviations

C. Prescribing guidelines

i. Bilateral Spherical refractive condition

1. Myopia

- a. Greater than 5D at any age
- b. 3-5D if between 1-3 years
- c. 1-3D if older than 3 years

2. Hyperopia

- a. Less than 2D do not Rx until 5 years, unless esophoria, esotropia, or amblyopia
- b. Greater than 2D, Rx with attention to excessive accommodative effort, risk of amblyopia, or strabismus
- c. Monitor lower amounts frequently

ii. Astigmatism

1. Magnitude greater/equal to 1.25D
2. Stable over 3 visits, 3 months apart
3. Child greater than 1 year old
4. VA below normal for child's age
5. Don't correct if under 1 year, monitor frequently

- iii. Anisometropia
      - 1. Normally, if under 3 years monitor
      - 2. Watch for all type of binocularity difficulties
      - 3. Prescribe if:
        - a. Magnitude greater than 1D
        - b. Stable over 3 visits, 3 months apart
        - c. Child greater than 3 years old
        - d. VA or binocularity is below normal for age
- V. Color Vision
  - A. Essential for all males
  - B. Can have the children trace the numbers
  - C. Figures are also available to use
- VI. Assessment of Ocular Health
  - A. Pupils
  - B. Anterior segment
    - i. Stand or kneel for routine slit lamp
    - ii. Hand-held slit lamp
    - iii. 20D lens with penlight
  - C. Fundus evaluation
    - i. Concentrate on posterior pole
    - ii. Indirect (binocular or monocular)
  - D. IOP
    - i. Digital
    - ii. NCT
- VII. Clinical Pearls
  - A. Establish Rapport-play with the children
  - B. Examiner should wear kid friendly clothing (no lab coats)
  - C. Allow child to stay with parent
  - D. Establish rules and the working position (in chair)
  - E. Have plenty of interesting toys/fixation targets for all ages-attention spans are very short!
  - F. Bribery does work-consider candy (if parent approved), stickers, treasure chests, and even pocket change.
  - G. Video's work well for holding fixation during retinoscopy/cover testing.
  - H. Work quickly and keep talking
  - I. Be very flexible, alter your routine when necessary. Be prepared to have patient back if their attention has worn out or mood is irritable.
  - J. Have FUN!

Further information is available through the AOA's Optometric Clinical Practice Guideline. Pediatric Eye and Vision Examination. St. Louis: American Optometric Association, 1995.



# Improving Our Children's Vision

Children's Vision Task Force  
of the

Michigan Optometric Association



# Shocking Statistics

- 35,886,000 children in the US between ages 5-13
- Over 18 million have not had their eyes examined
- 14% of three year olds have vision problems
- 40% of children will have difficulties by high school graduation

# Statistics

- 20% of children 9-15 need glasses
- 90% of them have not received them
- Fewer than 15% of all preschool children receive a comprehensive eye examination
- Fewer than 20% of all preschool children receive some type of vision screening

# Comprehensive Eye Exams

- A recent survey showed that most parents are not aware of the importance of a comprehensive eye exam
- A screening cannot replace an exam
- An exam should include more than just how well a child can see (visual acuity)

# Vision Screenings

- The standard eye chart used can only detect near-sightedness, not farsightedness or astigmatism
- Far-sighted children are more likely to have visual perceptual problems and difficulty reading: *these are the same children that will pass most visual screenings*

# Vision Screenings

- Often don't evaluate ability to *sustain* clear, comfortable, and efficient vision on desktop tasks such as reading and writing
- Few non-professional screening techniques accurately reveal learning-related vision problems

# Comprehensive Exams Include:

- Binocular status (eye teaming)
- Stereo depth perception
- Color vision
- Eye Muscle movements
- Sensory-motor development
- Ocular health assessment internally and externally

# Ocular Health

- A child's should be evaluated much like an adult's
- Similar diseases to those found in adults, but at such a young age, can cause devastating visual loss



# Development of Vision

- Sensitive periods occur in a child's development, most within the first 18 months
- Vision is one of the primary senses for concept development in infants
- Early assessment of eye and vision development should occur *during the first year of life*

# The First Examination

American Optometric Association recommendations:

- 6-8 months for a child with no risk factors, and again around 3 years of age or as recommended
- Birth to 6 months for the child at risk, and then as recommended



# At Risk Children:

- Born prematurely
- Low birth weight
- Oxygen at birth
- Family history of visual defect
- Poor mother's health during pregnancy
- Nutritional deficiencies
- Difficult or assisted labor
- Fetal distress
- Low appgar scores
- Diagnosed genetic abnormality
- Motor abnormalities

# Amblyopia

(decreased visual acuity in one eye)

- Affects 2-5% of children (75,000-200,000 preschoolers)
- These children will be 16 times more likely to go blind than non-amblyopic children
- Amblyopia accounts for more loss of vision before age 45 than all other ocular disease and trauma combined!

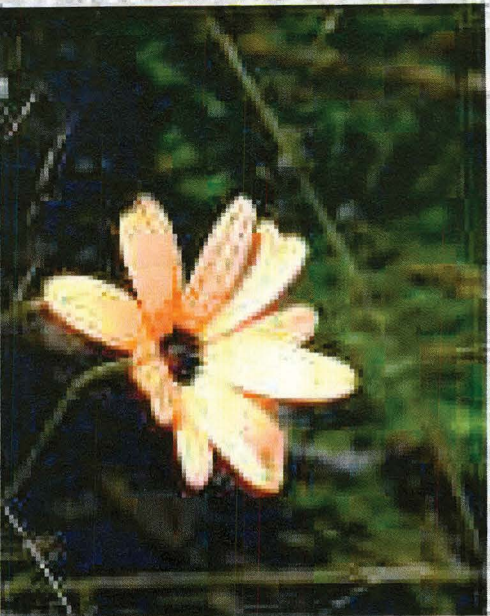
# Amblyopia

- Common therapies include patching, surgery, optical correction and vision therapy
- Strabismus, commonly known as crossed or lazy eyes, is a major cause and should be corrected prior to age 24 months
- Congenital cataracts (another cause) should be corrected by 6 months

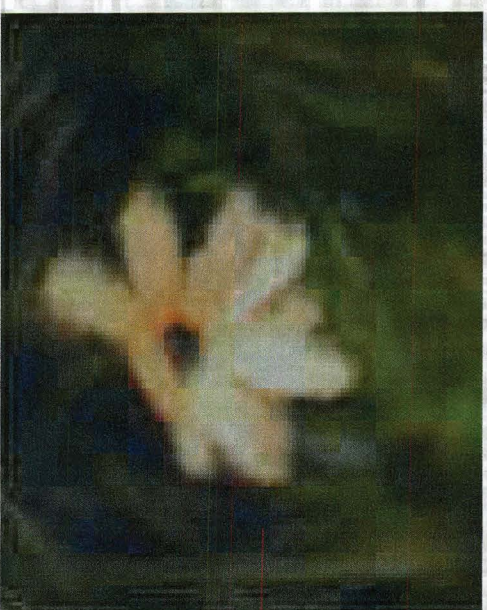
# Amblyopia

- Acuity improvement with patching is best between the ages of 18 months and 36 months and lessens until difficult improvement is noted after the age of 12
- Commonly diagnosed in a school screening, this is often too late in a child's life to make major corrections

# What is it like?



**Clear vision out of  
an eye with normal  
sight.**



**Blurred vision out  
of a lazy eye using  
the best glasses.**

# Common Visual Symptoms

*These may indicate a visual problem*

- Red eyes
- Sore eyes
- Eyes itch
- Eyes water
- Swollen eyes
- Eye rubbing
- Jerky eye movements
- One eye turning in or out
- Squinting
- Excessive blinking



# Other/Additional Visual Symptoms

- Head tilting
- Closing or blocking one eye when reading
- Difficulty noticing objects at a distance
- Difficulty following a moving object
- Blurred or double vision
- Sensitivity to light
- Words and lines running together or words jumping
- Headaches, dizziness, or nausea after reading

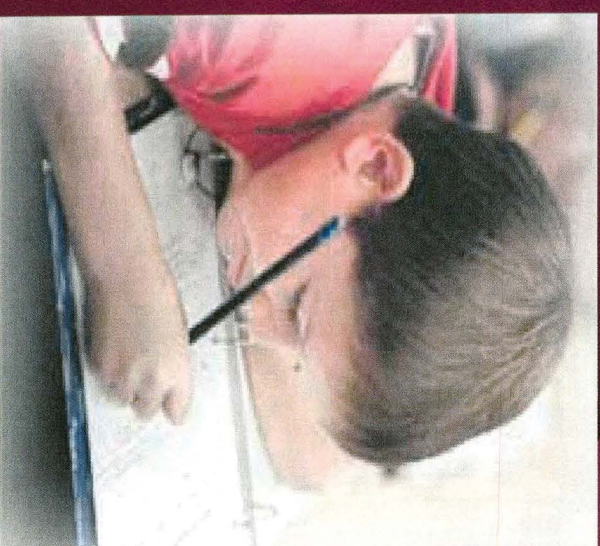
# Performance Clues

*These may indicate a visual problem*

- Avoidance of near work
- Frequent loss of place
- Omits, inserts, or rereads letters/words
- Confuses similar looking words
- Failure to recognize the same word in the next sentence
- Poor reading comprehension

# Performance Clues

- Letter or word reversals after first grade
- Difficulty copying from the chalkboard
- Poor handwriting
- Inconsistent or poor sports performance
- Misaligns numbers
- Book held too close or too far from the eyes



# Secondary Symptoms

*These may indicate a visual problem*

- Good in everything but school
- Low self-esteem
- Poor self-image
- Temper flare-ups
- Aggressiveness
- Frequent crying
- Short attention span
- Fatigue
- Frustration
- Stress
- Irritability
- Daydreaming

# Labels:

often have concurrent visual problem

- Lazy
- Dyslexic
- Attention deficit disorder
- Slow learner
- Behavioral problems
- Juvenile delinquent
- Working below potential

# Learning and Vision

- Three interrelated areas of visual function are
  - Visual pathway integrity including eye health, visual acuity, and refractive status
  - Visual efficiency including accommodation (focusing), binocular vision (eye-teaming), and eye movements
  - Visual information processing including identification and discrimination, spatial awareness, memory and integration with other senses

# Learning and Vision

- Children at risk for learning-related vision problems should receive a comprehensive eye exam
- People with reading difficulties often have co-existing visual and language processing deficits
- Unresolved visual deficits can impair the ability to respond fully to educational instruction

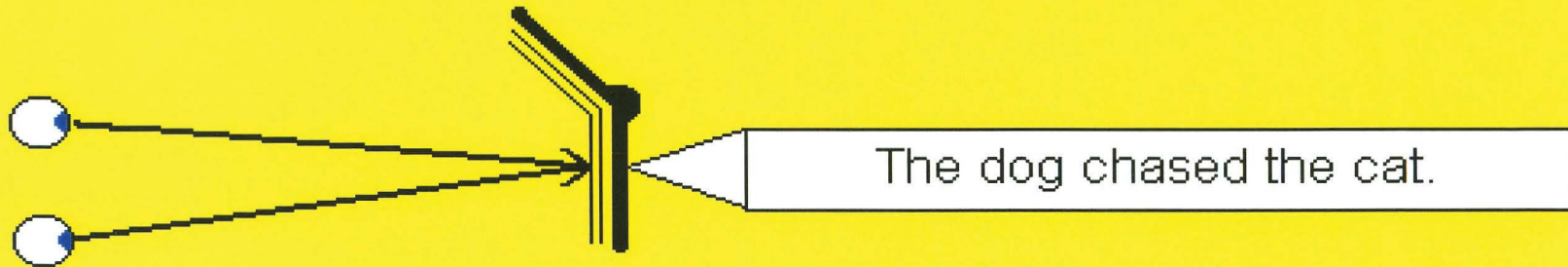
# Visual Defects Impact Reading

- Decreased visual acuity
- Eyestrain and double vision resulting from eye muscles not working together correctly
- Restriction in the visual field
- Increased awareness of glare or light sensitivity

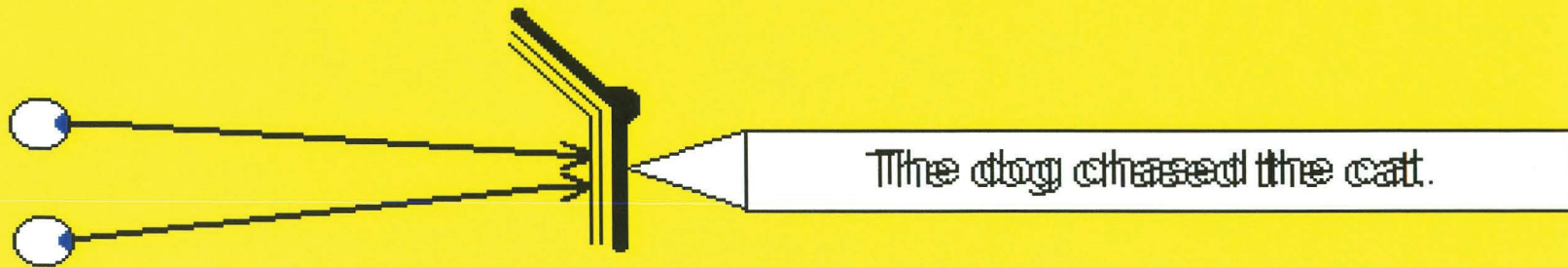


# Double Vision

When the eyes team and aim together normally, print on the page is single and clear.



When eye teaming breaks down, the eyes aim independently, and print doubles.



# Reading Disabilities

- Some individuals 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

# Reading is Multifaceted

- By improving visual skills we can help the overall learning process and academic performance
- Accomplished through activities known as vision therapy

# What Can I Do?

- Most vision related problems are preventable and treatable if caught early!
- Talk to your local optometrist, ophthalmologist or pediatrician about any concerns you may have about your child's health and vision
- Be aware of your child's habits while doing vision related tasks
- Get regular eye examinations and ask questions about the results of that exam

# Developing Your Infant's Vision: At 1 Month

- Hold and feed the infant from alternating sides
- Place the baby in crib from different directions
- Periodically change the location of crib so the infant can see the world from different viewpoints
- Hang a mobile off to the side to see it through the crib slits
- Change the position of that mobile frequently

## At 2 Months



- Allow the baby to explore with his or her hands
- Provide stimuli of many different textures, sizes, weights, and forms
- Place a lightweight rattle in your baby's hands and help him or her to shake it

# At 4 Months

- Allow the baby to help hold the nursing bottle
- Provide clean, smooth objects that can be explored with mouth and hands
- Play the “patty cake” game



## At 6 Months

- Play “peek-a-boo” to develop visual memory
- Move the crib mobile closer to your baby so it can be reached and hit to make it move
- Tie bells on booties so the infant can learn about his or her body through sound and movement

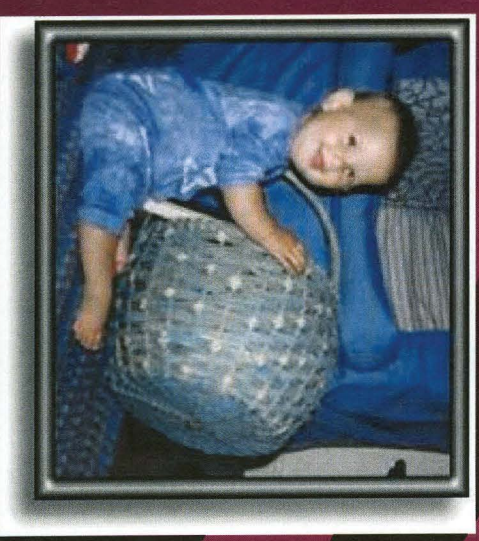


## At 8-12 Months

- Talk to your baby frequently so he or she can associate experiences with words
- Place objects on a highchair tray that they can be pushed off and dropped to the floor
- Remember not to rush the baby into walking. Crawling is important for developing coordination

# Developmental Milestones for Your Infant

- Follows an object with eyes by 5 weeks
- Brings hands together by 8 weeks
- Holds direct eye contact by 3 months
- Turns eyes together to locate near objects by 4 months



# Milestones

- Makes the sounds p, b, t, d, and m by 5 months
- Rolls over independently by 7 months
- Sits without support by 8 months
- Crawls by 9 months

# The Eye Examination

- Know the child's family history of eye and health related diseases
- Write down any questions you may have beforehand to help with remembering them
- Schedule an appointment when the child is most cooperative
- If an infant, bring familiar toys to help keep the child's attention

# Organizations with more information

- American Optometric Association (AOA)
- Michigan Optometric Association (MOA)
- Operation Bright Start (OPS)
- Parents Active for Vision Education (PAVE)
- College of Optometrists in Vision Development (COVD)
- Lion's clubs
- American Foundation for Visual Awareness (AFVA)
- Better Vision Institute (BVI)

