Preschool Vision Screening Guidelines

Revised 2000
Preschool Vision Screening Guidelines

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I. Introduction

The goal of vision screening is the prevention of serious vision problems through early detection and referral for treatment. Ohio law requires that children receive a vision screening by November 1st of the year they start kindergarten, but many children do not have their vision checked before this.

In 1992, Prevent Blindness Ohio received funding from the Ohio Department of Health to survey state and local agencies to find out what methods they were using to find infants and toddlers with vision problems. Results of this survey showed that there is no standard way to screen for vision problems during the first years of life. These years make up a critical period for the development of visual skills.

In order to develop some guidelines for preschool vision screening, the Ohio Department of Health and Prevent Blindness Ohio formed the Consortium on Preschool Vision Screening Guidelines. The purpose of this consortium was to develop standards for use in screening children from birth to five years of age for vision problems. The committee members include vision professionals, representatives of local and state agencies, both private and public, and a parent of children with vision problems.

Over the years, the importance of early identification of children with visual impairments has become increasingly apparent. In 1986, the United States Congress passed Public Law 99-457. (In 1991, it was re-authorized as Public Law 102-119 and renamed the Individuals with Disabilities Education Act or IDEA). This law requires that children with disabilities, including vision problems, receive a free and appropriate public education from the time they are three years old until they are twenty-one. IDEA also provides funding to states that agree to provide certain types of services for children from birth to three. One of the services involves finding infants and toddlers with disabling conditions, including visual impairment. Ohio has agreed to do this and receives money for it from the federal government.

This document, Preschool Vision Screening Guidelines, is the result of the work of the Consortium on Preschool Vision Screening Guidelines. These guidelines are written for organizations and individuals who provide vision screening for children from birth to five years of age. Recommendations for screening procedures and criteria for referral are provided; also included is information on normal visual development and common types of vision problems.

Through the effective use of preschool vision screening, children with eye problems can be referred to the proper sources for examination, diagnosis, and treatment. Early detection and correction can save a child from a lifetime of visual impairment.
II. How Does Normal Vision Develop?

In order for a person to see, several things must happen:

1. the eyes must be able to catch light and send signals to the optic nerves;
2. the optic nerves must be able to send signals to the brain’s visual cortex; and
3. other sections of the brain must be able to use the signals from the visual cortex.

For a person to see normally, all parts of this visual system must work.

The visual system is not fully developed at birth. An infant with normal vision will not be able to see things as clearly as an adult with normal vision. The baby’s eyes do not work together all the time until about four months of age. Pathways carrying signals to the brain, and the brain itself, continue to develop during the early years of life.

As the eye and the visual cortex of the brain develop, a child’s ability to see detail improves. As the eyes begin to work together, the brain learns to combine the images from the two eyes into a single image. The child learns how to use the signals in the brain to recognize things, such as faces and toys, and to tell the difference between things that look similar. Vision continues to develop until a child is about nine years old.

III. What Vision Problems Will Be Found By Screening?

If the eyes are not used properly, vision will not develop normally. It is possible that vision may get worse. For this reason, it is important to find and treat children with problems affecting the visual system as early as possible. Young children with vision problems are much less likely to explore the world around them. They may miss many important experiences. This causes them to have trouble learning to sit, to stand, to walk, to learn the names for things, and many other things. The earlier a vision problem is treated, the more likely a child is to develop normal skills.

Two common pediatric eye problems that need to be found early are amblyopia and strabismus. Amblyopia (“lazy eye”) is poor vision in one eye (or poorer vision in one eye than the other) that occurs when the brain “turns off” the poorer eye because it cannot use the eyes equally at the same time. There are three major causes of amblyopia:

1. strabismus (described below);
2. a focusing problem causing one eye to be more blurry than the other anisometropia, and
3. an eye disease such as a cataract preventing one eye from seeing clearly.

In many cases of amblyopia, the eyes look normal, but the child uses only one eye. The way to find amblyopia is to measure the vision in each eye. This is often difficult to do in young children, but the earlier amblyopia is found, the more likely treatment will be successful.

Strabismus and anisometropia are the most common causes of amblyopia. In strabismus, one eye is usually directed straight ahead and the other may be turned inward, outward, upward, or downward. The eyes may appear to be crossed, drifting, or wandering. Normally, both eyes are aimed at the same target and the brain puts the two “pictures” together into one 3-D picture (depth perception). If one eye is aimed at a target that is different from the other eye, two different pictures are sent to the brain. Because the brain
cannot fuse these different pictures, it “ignores” or suppresses the picture from the eye that is turned. This can cause decreased vision (amblyopia) in one eye and loss of depth perception. The earlier in life the eyes are straightened, the better chance the child has of developing good vision and depth perception.

Other vision problems that can be detected by screening are focusing problems, such as nearsightedness, farsightedness, and astigmatism, that can be corrected with glasses. Medical conditions that can affect visual development, such as cataracts or disorders of the inner eye, may also be picked up by screening. Appendix F includes a description of some other types of eye problems a child can have.

IV. Who Should Do The Vision Screening?

The best way to evaluate thoroughly a child’s vision is to have an eye professional do a complete exam. Screening tests will not find all the children who have vision problems. The tests described in the following sections do not take the place of a complete examination by an eye professional. They are intended to identify children who have strabismus, poor eye health, and problems with sharpness or clarity of vision.

The best way to screen a child for vision problems is to have an eye professional do a combination of screening tests. If this is not possible, a person with special training in vision screening can do certain tests. The tests that the trained screener should use depend on the age of the child and whether the child can talk or sign well. Some of the tests listed in the following section are to be done only by an eye professional.

It is important that the individuals performing vision screening on preschool children be thoroughly trained in this area. Training can be arranged through any of the agencies and organizations listed in Appendix D.

V. Which Methods And Tests Should Be Used In Vision Screening?

Screening for vision problems includes the following steps:

A. External Observation

The screener will look closely at the child and note any conditions that might be associated with vision problems. These conditions include the following:

- red, swollen eyes and eyelids
- crusty eyelids
- unequal pupil size or shape
- frequent rubbing or blinking of eyes
- constant tilting or turning of head
- covering one eye while doing close work
- squinting or thrusting the head forward while looking at distant objects
- cloudy looking eyes
- growth on lid or eye
- drooping eye lids
- crossing or drifting of eyes
- eyes in constant motion
- often holding objects or books close to the face
B. Screening Tests

The screener will have the child perform some tasks that require use of vision and note how well the child did with the tasks. The decision about which test to use for screening a child will depend on how well the child talks or signs, what tests are available, and how much training the screener has. If a child has trouble completing one type of visual acuity task, a different visual acuity task should be selected. One child might do better when matching pictures, while another does better pointing out directions. It is a good idea to have a variety of tests available, so that a screener can select a different test if the child is having difficulty with the one used first. If a child cannot complete any of the visual acuity tests specified, the child fails the screening and should be referred.

If you are considering buying a test and need help with the selection or finding a vendor, you can call any of the agencies listed in Appendix D.

1. Screening for infants and toddlers who cannot talk or sign well

<table>
<thead>
<tr>
<th>Screening tests by an eye specialist for infants and toddlers</th>
<th>Screening tests by a vision screener for infants and toddlers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>External Observation</td>
</tr>
<tr>
<td>Visual Acuity</td>
<td>Preferential Looking Test</td>
</tr>
<tr>
<td>Retinoscopy</td>
<td>(Teller Acuity Cards)</td>
</tr>
<tr>
<td>Muscle Balance Test</td>
<td></td>
</tr>
<tr>
<td>Ophthalmoscopy</td>
<td></td>
</tr>
</tbody>
</table>

The best way to screen children in this group is for an eye professional to do a combination of tests. These should include, at least, external observation, screening tests for visual acuity, retinoscopy (refractive error), muscle balance, and ophthalmoscopy (ocular health).

A visual acuity test called the Teller Acuity Card Procedure, (see Figure 1) a preferential looking test, can also be used to test children who do not talk or sign well. This test contains a series of cards with peepholes in the middle and light and dark stripes on one side. The tester watches through the peephole to see whether the child looks at the side that has the stripes. By presenting cards with smaller and smaller stripes, the tester can estimate how clearly the child can see. This test is relatively expensive and must be done by well-trained personnel. When it is possible to use it, though, it will be a good addition to a screening program for children in this group. Instructions for performing this test are not included in these guidelines; persons planning to use it need to receive thorough training from one of the agencies listed in Appendix D.
There are two new techniques that shows promise as tools for screening for certain vision problems in infants and toddlers who do not talk or sign well. These two techniques are photorefraction and autorefraction. As researchers continue to study these two methods to determine how they can be used effectively in vision screening of infants and toddlers the consortium will consider adding them to the screening tests.

2. Screening for toddlers and preschoolers who talk or sign well

<table>
<thead>
<tr>
<th>Screening tests by an eye specialist for toddlers and preschoolers who talk or sign well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screening tests by a vision screener for toddlers and preschoolers who talk or sign well</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Observation</td>
</tr>
</tbody>
</table>

The best way to screen children in this group is for an eye professional to do a combination of tests. These should include, at least, external observation, screening tests for visual acuity, retinoscopy (refractive error), muscle balance, and ophthalmoscopy (ocular health). A screening test for stereopsis can also be included.
If a professional is not available to do the screening, a trained screener should use external observation, a screening test of visual acuity and a screening test for stereopsis. The table lists tests that can be used. Instructions for performing these tests can be found in Section VII.

<table>
<thead>
<tr>
<th>Recommended screening tests of visual acuity for toddlers and preschoolers</th>
<th>Recommended screening tests of stereopsis for toddlers and preschoolers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken Wheel Acuity Cards</td>
<td>Lang Test</td>
</tr>
<tr>
<td>HOTV Chart</td>
<td>Random Dot E</td>
</tr>
<tr>
<td>LEA Chart</td>
<td></td>
</tr>
<tr>
<td>Tumbling E Chart</td>
<td></td>
</tr>
</tbody>
</table>

**VI. Age-appropriate Screening Tests**

For best results, screening tests should be appropriate for the child’s age. The following screening tests for visual acuity and stereopsis are generally usable on children at the ages listed below:

<table>
<thead>
<tr>
<th>Screening tests for visual acuity</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teller Acuity Cards</td>
<td>6 months to 3 years</td>
</tr>
<tr>
<td>Broken Wheel Acuity Cards</td>
<td>3 to 5 years</td>
</tr>
<tr>
<td>HOTV Chart</td>
<td>3 to 5 years</td>
</tr>
<tr>
<td>LEA Chart</td>
<td>3 to 5 years</td>
</tr>
<tr>
<td>Tumbling E Chart</td>
<td>5 years</td>
</tr>
</tbody>
</table>

(when a child can consistently point out right and left, as well as up and down)

<table>
<thead>
<tr>
<th>Screening tests for stereopsis</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lang Test</td>
<td>3 to 5 years</td>
</tr>
<tr>
<td>Random Dot E</td>
<td>3 to 5 years</td>
</tr>
</tbody>
</table>

The following screening tests for stereopsis are generally usable when done on children at the ages listed below:
VII. How Are The Screening Tests Done?

A. General Procedures For Visual Acuity Testing And Observation

1. Make sure the room in which you are testing is quiet, has no distractions (like pictures, toys, and other children), and is well-lighted and free from glare. Do not shine a spotlight on the charts.

2. Measure out the distance you need for the test that you are using. (Different tests are done at different distances.) Put masking tape on the floor to mark the correct distance. The child can be seated or standing. Make sure the child's eyes are in a direct line above the tape. The charts should always be used at the child's eye level.

3. Children who wear glasses should be tested with their glasses on in all the tests described below.

4. For many of the tests, you will need an occluder (something to cover the eye that is not being tested). You can use any of a number of easily available items: paper cups, paper patches, index cards, or the palm of the child's own hand. If you use any paper materials, throw each piece away after using it on one child. If children use their hands, be sure they are not peeking through their fingers. You can also use shapes cut out of construction paper and give them to the children to keep.

5. Watch carefully to be sure that the child is not peeking, tilting the head, or squinting. If at all possible, have someone stay next to the child and watch closely. Children want to do well on these tests and will often peek, tilt the head, or squint to compensate for vision problems. This may cause a child with a vision problem to pass the screening Make sure, too, that the child studies the cards or charts for a few seconds in order to avoid random pointing.

6. Look at the child closely for signs of eye infections. If the eye is red or swollen or crusty, the child needs to be referred for medical attention. Do not test the child's vision until the eye problem has been treated.

B. Broken Wheel Acuity Cards

1. Equipment

The Broken Wheel Test consists of 6 pairs of cards with the following acuities: 20/100, 20/80, 20/60, 20/40, 20/30, and 20/20. In each pair, one card has solid wheels while the other has Landolt C or “broken” wheels. (See Figure 2.) You will need occluders and Broken Wheel Acuity Cards for use at a 10-foot testing distance.
2. Procedure
   a. Training Session
      Before testing visual acuity with the Broken Wheel method, train the children to do the test. It may save some time to tell several children at one time how to do a test, but the screener should review it with each child to be sure the child can perform the task.

      1) Let the child use both eyes to look at the 20/100 cards at 20 inches to see the difference between the wheels on the two cars. Show the child the card that has the car with complete wheels and say, “This car has good wheels.” Then show the other card and say, “This car has broken wheels.”

      2) Shuffle the cards and let the child use both eyes to look at them. Ask the child to point to the car with the broken wheels. Repeat this process 3 or 4 times until you are sure that the child understands the task.

      3) Let the child use both eyes to look at the 20/100 pair of cards at a 10-foot distance. Again, ask the child to point to the car with the broken wheels. When you are sure that the child understands the task, move on to the testing session.

   b. Testing Session
      1) The test is done using one eye, with the other eye covered. Begin by testing the right eye, with the left eye covered. Make sure the child is not peeking. Shuffle, then present, each set of cards at the child’s eye level. Begin with the 20/80 test pair at 10 feet. Ask the child to point to the card that has a car with a broken wheel. If the child points to the correct card, try the 20/60 test pair.

      If the child points again to the correct card, show the 20/30 test pair. Ask the child to point to the card that has a car with a broken wheel, shuffle the cards, and repeat. Do this four times altogether.

      If the child correctly points to the card that has the car with a broken wheel all four times, the child passes the screening. Four of four correct answers on the 20/30 pair of cards is passing. If the child is not able to point to the correct card four out of four times at the 20/30 level, this is a failure.

      2) Repeat the procedure for the left eye using the 20/80, 20/60, and 20/30 pairs of cards at 10 feet.

   c. Recording Results
      Use the form “Results of Vision Screening,” found in Appendix B, to record the results. In the spaces next to the words “Broken Wheel Acuity Cards” and under the words “Right eye,” circle “P” for pass if the child has answered correctly on the 20/30 pair of cards four out of four times while using the right eye; circle “F” for fail if the child has not responded correctly four out of four times. Record the results for the left eye in the same way, under the words “Left eye.” If numerical visual acuity is required for recordkeeping, record the best visual acuity achieved in each eye separately.
C. LEA, HOTV, and Tumbling E Acuity Charts

1. Equipment

You will need occluders and a LEA, an HOTV, or a Tumbling E chart, developed for use at 10 feet, with the following acuities: 20/100 to 20/15 for the LEA chart and 20/200 to 20/20 for the HOTV chart. (See Figures 3, 4 and 5.) All of these charts must be used with self-illuminated boxes.

2. Procedure

a. Training Session

Before testing visual acuity with the LEA, HOTV, or Tumbling E chart, train the child to do the test. It may save some time to tell several children at a time how to do a test, but the screener should review it with each child to be sure the child can perform the task.

1) LEA Chart (see Figure 3.)

Let the child use both eyes to look at the 20/100 symbols at 13 inches to make sure that the child can correctly name the symbols. If the child does not know the name of a symbol, offer a name and ask the child to repeat it. If the child consistently uses another name for the symbol, use that name while testing that child. When you are sure that you and the child are using the same or a similar name for a symbol, move on to the testing session.

If the child has trouble naming the symbols, you may use the LEA chart as a matching chart. Give the child the matching card that comes with the LEA chart; point to a symbol on the eye chart and have the child point to the same symbol on his card. If the child can do the task, move on to the testing session.

2) HOTV Chart (figure 4)

Let the child use both eyes to look at the 20/100 letters at 13 inches to make sure that the child can correctly match the letters. Point to a letter and ask the child to point to the same letter on a separate card that contains the letters H, O, T, and V. Move on to the testing session.
3) Tumbling E Chart (figure 5)
Let the child use both eyes to look at the 20/100 symbols at 13 inches to make sure that the child can correctly point in the same direction as the lines on the E (up, down, right or left). When you are sure that the child understands the task, move on to the testing session.

If the child has trouble pointing correctly, point to an E and have the child point to the E with the lines pointing in the same direction on a separate card that has Es pointing up, down, right, and left. When you are sure that the child understands the task, move on to the testing session.

b. Testing Session
1) Begin by testing the right eye, with the left eye covered. Make sure the child is not peeking from behind the cover.

2) Ask the child to name or match the first symbol (LEA), to match the first letter in each line (HOTV), or to indicate the direction the lines are pointing on the first E down to the 20/30 row.

3) Ask the child to name or match each remaining symbol (LEA), match each remaining letter (HOTV), or indicate the direction of each E (Tumbling E) in the 20/30 row.

4) In order to pass the screening, the child must correctly identify or match 3 out of 5 symbols on the 20/32 row on the LEA Chart, match 5 out of 6 letters in the 20/30 row of the HOTV chart, or correctly indicate the direction of the E 5 out of 6 times in the 20/30 row of the Tumbling E chart.

5) Repeat the procedure for the left eye beginning with the 20/100 row and ask the child to name or match the last symbol (LEA), match the last letter in each line (HOTV), or indicate the direction of the lines on the last E down to the 20/30 row.

c. Recording Results
Use the form “Results of Vision Screening,” found in Appendix B, to record the results. In the spaces next to the name of the test you used, (“LEA” or “HOTV” or Tumbling E) under the words “Right eye,” circle “P” (for pass) if the child has correctly named or matched three out of five symbols (LEA), matched five out of six letters (HOTV), or indicated the correct direction on five out of six Es on the 20/30 row while using the right eye; circle “F” (for fail) if the child has not correctly responded correctly five out of six times. Record the results for the left eye in the same way, under the words “Left eye.”

D. Lang Stereotest
1. Equipment
The Lang Stereotest set consists of one demonstration card and one test plate. The card and the test plate have pictures of three objects: a cat, a star, and a car. The pictures on the test plate are “hidden” in dots that are placed randomly on the card.
(See Figure 6.) A person who is not using both eyes together will not be able to see these pictures. The picture disappears when the card is turned from a sideways position to an up-and-down position, even though the person is still looking at the front of the card.

Make a copy of the demonstration card and cut out the pictures. Glue them onto cardboard or heavy paper so that they are all the same size. (The pictures on the demonstration card are in the same places as on the test card; if you use the demonstration card, a child might be able to memorize the places and pass the test even if the child has a problem with depth perception.)

You will not need occluders or polarized glasses for this test.

Figure 6.

2. Procedure
   a. Training Session
      Show the cut-out-pictures and ask the child to name the objects. If the child does not know the name of an object, say the name and ask the child to repeat it. If the child consistently uses another name for the object, use that name while testing that child. Move on to the testing session.

   b. Testing Session
      1) **Make sure the child is using both eyes to look at the test card.**
      2) Hold the test card facing the child at a distance of 16 inches. Do not let the child hold the card. It is okay for the child to move the head to find the best position for seeing the pictures.
      3) Ask the child to look for things “hidden in the dots.” If the child does not name and point to each picture on the test card, do the training session again. If the child still does not name and point to each picture, the child has failed the screening and the test is over.

   c. Recording Results
      Use the form “Results of Vision Screening,” found in Appendix B, to record the results. In the spaces next to the word “Lang,” circle “Pass” if the child has named and pointed to each picture correctly. Circle “Fail” if the child has not named and pointed to each picture correctly.
E. Random Dot E Stereotest

1. Equipment
You will need a Random Dot E Stereotest set consisting of 2 test cards, a demonstration card, and two pairs of polarized glasses. The test distance is 5 feet.

The test cards are 8 x 10 cm plates that contain dots arranged in a random pattern. (See Figure 7). When the cards are viewed through polarized glasses, one of them contains an E figure that seems to “pop out”; the other does not. The demonstration card has a model of the E test figure, physically raised to show the figure shape to the child.

2. Procedure
a. Training Session
1) Show the child the raised E figure on the demonstration card. Tell the child that the E figure is “popping off the card” and ask the child to point to it. This will allow you to be sure that the child can identify an E figure.

2) Put a pair of polarized glasses on yourself. These will make it possible for you to see the eyes of a child who is wearing polarized glasses and will make it easier for you to figure out where the child is looking.

3) Next, put the polarized (“magic”) glasses on the child. Let the child use both eyes to look at the two test cards at 20 inches. Tell the child to point to the card that contains the E. Repeat this process 3 to 4 times until you are sure that the child understands the task. Then move on to the testing session.

b. Testing Session
1) Let the child use both eyes, with the glasses on, to look at the test cards at 5 feet. If the child fails to look at the card that contains the figure, use the demonstration card set again to show the shape of the figure. Then, show the test cards again at 20 inches. If a child gives an incorrect response or does not see the figure, the child has failed the screening and the test is finished. If the child does respond correctly at 20 inches, move the cards to 5 feet and continue the test.

2) Present the cards four times at the 5-foot distance. Shuffle the cards behind your back after each presentation. In order to pass the screening, a child must identify the correct card on each of the four presentations.

c. Recording Results
Use the form “Results of Vision Screening,” found in Appendix B, to record the results. In the spaces next to the words “Random Dot E,” circle “Pass” if the child has identified the correct card four out of four times at the 5-foot distance; circle “Fail” if the child has not identified the correct card four out of four times.
VIII. When should a child be referred to an eye care provider?

A child should be referred to an eye care provider under any of the following circumstances:

1. if external observation indicates a condition that might be associated with a vision problem;
2. if the child has failed any of the screening tests for visual acuity or stereopsis, or
3. if the child cannot be screened at the appropriate age for a standardized test.

Summary of Reasons for Referral

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>External observation</td>
<td>See page 3</td>
</tr>
<tr>
<td>Broken Wheel Acuity Cards</td>
<td>Unable to point to correct card four out of four times at 20/30 level</td>
</tr>
<tr>
<td>HOTV Chart</td>
<td>Unable to name or match five out of six letters on the 20/30 line</td>
</tr>
<tr>
<td>LEA Chart</td>
<td>Unable to name or match three out of five symbols on the 20/32 line</td>
</tr>
<tr>
<td>Tumbling E Chart</td>
<td>Unable to name or match five out of six letters on the 20/30 line</td>
</tr>
<tr>
<td>Lang Stereotest</td>
<td>Unable to see three out of three pictures</td>
</tr>
<tr>
<td>Random Dot E Stereotest</td>
<td>Unable to identify correct card four out of four times at 5-foot distance</td>
</tr>
</tbody>
</table>
IX. Appendices
Appendix A

Factors that can cause a Child Birth to Three to be at High Risk for Vision Problems

Information for parents, guardians or caregivers.

Children do not know how they should see. Often children cannot tell you how they do see. During the early years of life, children will learn to use their eyes. At first, babies learn to recognize familiar faces. Next, they begin to figure out how to reach and hold onto things that they see. By the age of four, children may be able to draw and name pictures, and copy shapes and letters. To do these things, children must have usable vision.

Babies who have vision problems may learn to “see” in a way that is different from babies with normal vision. Babies or toddlers with vision problems may need special help to learn skills like eating, playing with toys, or naming common things (like a ball, a book, or a shoe). Babies who have vision problems need special help during the first years of life. Without help, children may not be able to “catch-up” later, even if the vision problem is fixed and their vision is normal. Children with vision problems may have trouble with school work. As adults, they may have trouble learning job skills. That is why it is very important to check a baby’s or a young child’s vision. We want to find vision problems as early as possible, so children with vision impairments get the special help they need.

Vision problems may not be obvious. Most vision problems are not painful. Even after looking at children’s eyes, and watching how they act, it may still be hard to figure out that they have vision problems.

There are many factors that can determine if your child is at high risk for vision problems. The following are a list of some of those factors.

1. Child with a blood relative with a vision loss in one or both eyes before age 25 that was not caused by an injury and was not corrected with glasses.

2. Child born more than six weeks before the expected due date.

3. Child spending any time in the neonatal intensive care unit or the special care nursery.

4. Child weighing less than 3 pounds and 5 ounces at birth.

5. Birth mother with any of the listed health problems during the pregnancy.

   - Rubella (German measles)
   - Histoplasmosis
   - Herpes
   - Toxoplasmosis
   - Cytomegalovirus
   - Exposure to radiation
   - AIDS
   - Drug abuse
   - Veneral infection
   - Alcohol abuse
6. Birth mother taking any of the listed medications during the pregnancy.
   - Dilantin (for seizures)
   - Phenobarbital (for seizures)
   - Coumadin (blood thinner)
   - Medicine for cancer

   Steroids
   - Chloroquine (for malaria)
   - Quinine (for malaria)
   - Accutane

7. Child with any of the listed illnesses or injuries
   - ✓ Meningitis/encephalitis
   - ✓ Growing too fast or too slow
   - ✓ Marfan’s syndrome
   - ✓ Thyroid problems
   - ✓ Albinism
   - ✓ Eye tumor
   - ✓ Brain tumor
   - ✓ Hydrocephalus
   - ✓ Leukemia
   - ✓ Diabetes

   ✓ Early closing of skull bones
   ✓ Problems with genes (ie Down Syndrome)
   ✓ Swelling of joints, pain in joints
   ✓ Herpes infection
   ✓ Sick cell disease
   ✓ Tan spots bigger than a quarter
   ✓ Injury directly to eye or eye socket
   ✓ Cerebral palsy
   ✓ Mental retardation
   ✓ Cancer
   ✓ A lot of freckles under the arm pit or in the groin area
   ✓ Severe head injury that caused problems with the brain
   ✓ Severe head injury that caused child to pass out
   ✓ Problem with the brain that gets worse over time
   ✓ Any illness treated with steroid shots, pills or liquid
   ✓ Inability to do things child was once able to do
   ✓ Weakness, along with problems relaxing muscles
# Appendix B

## Results Of Vision Screening

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<thead>
<tr>
<th>Child's Name</th>
<th>Child's Birthdate</th>
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### Visual Acuity Screening Test

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</tr>
<tr>
<td>HOTV</td>
<td></td>
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</tr>
<tr>
<td>LEA</td>
<td></td>
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### Stereopsis Screening Test

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**FOR USE BY EYE PROFESSIONAL ONLY**

### Other Tests

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### Screener's name

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### Date of screening

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### Screener's title

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Appendix C

Agencies Approving The Preschool Vision Screening Guidelines

Ohio Department of Job and Family Services
Ohio Department of Education
Ohio Department of Health
Child Development Council of Franklin County Head Start
Prevent Blindness Ohio
The Sight Center, Toledo
Cleveland Sight Center
Goodwill Industries, Youngstown
Columbus Children’s Hospital
Ohio Ophthalmological Society
Ohio Optometric Association
Appendix D

Agencies And Organizations That Provide Training in These Vision Screening Guidelines

Ohio Department of Health
Bureau of Child and Family Health Services
Field Services Section
246 North High Street
Box 118
Columbus, Ohio  43216-0118
(614) 466-5332

Prevent Blindness-Ohio
1500 West Third Avenue
Suite 200
Columbus, Ohio  43212
(614) 464-2020

Cleveland Sight Center
1909 East 101st Street
Cleveland, Ohio  44106
(216) 791-8118
Appendix E

Members of the Committee on Preschool Vision Screening Guidelines

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Goodwill Industries—Rehab. Division  
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Ohio Department of Education  
933 High Street  
Worthington, OH 43085  
614-466-2650  
Fax: 614-752-1622
Appendix F

Frequently Asked Questions regarding Save Our Sight (SOS)

1. **Why was the SOS program established?**
   One in four schoolchildren and one in twenty preschoolers has a vision problem. If left untreated, vision problems may affect a child’s learning ability. The goal of the SOS program is the preservation of good vision in children through early detection of vision problems and a reduction in the occurrence of childhood eye injuries.

2. **When did the SOS program begin?**
   The SOS program began on April 1, 1999. One dollar is requested of each Ohio motorist when renewing motor vehicle registration.

3. **Where does my money go?**
   After collection by the motor vehicle deputy registrars, the SOS dollars go to the Ohio Department of Health (ODH). ODH then funds SOS vision programs through grants to 501(c) statewide vision services organizations.

4. **What is a 501(c) organization?**
   A 501(c) organization is an organization exempt from federal income taxation; a “non-profit” organization.

5. **How much of the money collected is spent on the program?**
   Only ten percent of the SOS money is used for administering the program; 90 cents of every dollar collected is spent on funded programs.

6. **What can the SOS funds be used for?**
   Programs expected to be funded for the current grant period, which runs until July 1, 2001, will address the following issues:
   a) Training and equipping vision screeners of preschool children;
   b) Educating children on vision and eye health through classroom instruction;
   c) Establishing a matching grant program for the purchase and distribution of protective eyewear to children, and
   d) Development of an amblyope (lazy eye) registry with two objectives:
      • To educate the general public about amblyopia, and
      • To provide information and support to parents or guardians of children with amblyopia. This support may include educational materials, resources and supplemental assistance for vision services.

7. **Does the SOS program address the needs of the visually impaired?**
   The SOS effort concentrates on the prevention, early detection and correction of eye problems in children. For children who are visually impaired, there are services available through other agencies, such as the Bureau of Services for the Visually Impaired, Rehabilitation Services Commission (614-438-1200).

8. **My child needs glasses and I can’t afford them; can the SOS program help?**
   The SOS program does not provide eyeglasses for the correction of visual acuity problems. There are other non-government and government programs, which address this need. Good places to begin to look for this type of help include your local health department, school nurse, or Lions’ Club. The Ohio Department of Health administers vision specialty clinics in 26 Ohio counties. You can find out where these clinics are and whom to contact on the ODH web page under programs.
Appendix G

Additional Information About Vision Problems

A. What Types Of Vision Problems Can A Child Have?

Vision problems can appear at any time during a child’s development. They can be caused by inherited conditions that affect other members of the family. Problems that affect vision can occur while the mother is pregnant or after the baby is born.

There are several types of vision problems. Some affect how sharply or clearly a child can see. Others affect the child’s ability to use the eyes together and to develop good vision in both eyes. Different types of visual problems are described in this section.

1. Poor visual acuity

People who have poor visual acuity do not see as clearly as they should. There are two types of visual acuity—distance and near. When a person has poor distance visual acuity, things that are far away seem blurry. When a person has poor near visual acuity, things that are close seem blurry. There are several different conditions, such as cataracts, refractive errors, and strabismus, that can cause a child to have poor visual acuity. The conditions are described in this Appendix. The treatment for poor visual acuity depends on what causes it.

Amblyopia is the name for poor visual acuity in one eye or worse visual acuity in one eye than the other that cannot be improved immediately with glasses alone. Some treatments for amblyopia include glasses, patching and eyedrops. It is very important to find amblyopia as early as possible. The longer the poorer eye is not used, the harder it will be to develop good vision and the brain’s ability to use the eyes together.

2. Loss of visual field

A person who has a loss of visual field does not see equally well in all directions when the head and eyes are held still. A person with a loss of visual field may see well in front, but not well to the sides; this person is said to have tunnel vision. Another person with a loss of visual field may see well to the sides, below, or above, but not in the center; this person is said to have good peripheral vision, but poor central vision. Another may have islands of vision surrounded by “blind spots.” Loss of visual field can be caused by a problem with the eyes, the nerve, or the brain. A child with a loss of visual field may need to have special help in learning how to use the part of the visual field that is intact.

3. Poor stereopsis (depth perception)

A person who has poor depth perception has difficulty figuring out which things are closer and which are farther away. To have good depth perception, a person must use both eyes together. Poor depth perception may indicate problems with the eye or the brain. It is very important to find poor depth perception as early as possible. The longer it exists, the harder it will be for the brain to develop the ability to use the eyes together.
4. **Poor color vision**
   A person who has poor color vision might have trouble matching colors or telling certain colors apart. It is very rare for a person to be unable to see colors at all. Poor color vision runs in families, and most people who have it are born with it. It can also be caused by diseases that affect the eye or by certain prescription drugs. It usually cannot be corrected.

5. **Poor visual perception**
   A person who has poor visual perception has difficulty understanding what the signals from the eyes mean. Often, the eyes and the optic nerve are healthy, but the brain cannot make sense of the signals. Poor visual perception problems can be caused by severe head injuries, infections that affect the brain, or a lack of oxygen at birth. In some cases, poor visual perception can change over time.

B. **What Conditions Interfere With Normal Visual Development?**
   There are many conditions that interfere with normal visual development. The most common ones are described in this section.

1. **Genetic syndromes**
   Some vision problems are part of a group of conditions (syndrome). Some syndromes, such as Marfan’s or Usher’s, run in the family. Other syndromes, such as Down, are caused by a genetic problem that occurs at the time of conception.

2. **Prenatal illness in mother**
   Some illnesses that a mother may have while she is pregnant can cause vision problems. Some examples are toxoplasmosis, rubella (German or three-day measles), cytomegalovirus, genital herpes, and syphilis.

3. **Perinatal conditions**
   Problems that occur around the time a baby is born can cause difficulties with vision. Some examples are prematurity (being born several weeks before the due date), low birth weight, problems that cause a baby not to get enough oxygen at birth, or being on a ventilator. Babies who weigh less than 3 pounds, 5 ounces at birth have four to five times the rate of vision problems than infants who weigh more.

4. **Refractive errors**
   When light enters the eye, it is bent so that it focuses on a place at the back of the eye called the retina. When light focuses correctly, it causes a clear image to be formed on the retina. A refractive error occurs when the light does not focus on the retina and a clear image is not formed. There are three types of refractive error: myopia or nearsightedness (poor distance visual acuity), hyperopia or farsightedness (poor near visual acuity) and astigmatism (distorted vision). A large difference between the refractive errors of the two eyes is called anisometropia. Refractive errors can usually be corrected with glasses or contact lenses.

Most children are normally farsighted and do not need glasses as adults do, because their focusing muscles are very strong. They can compensate for this unless they are extremely farsighted, in which case they might need glasses.
5. Muscle Imbalance

Each eyeball has six muscles connected to it. These eye muscles hold the eyeballs in place, and make the eyes move up, down, and to the side. When the muscles work correctly, the eyes move together. Strabismus, a form of muscle imbalance, occurs when a person’s extraocular muscles do not work together properly.

When the eyes are not turned in the same direction, a child sees two images. The brain cannot make sense of both images at the same time, so it ignores the image from the deviating eye. If the image is ignored for too long, the visual acuity in that eye will decrease and depth perception will be impaired.

Types of muscle imbalances are esotropia, (one eye turns in) exotropia (one eye turns out), hypertropia (one eye turns up), or hypotropia (one eye turns down). Sometimes the muscle imbalance is not obvious, because the brain works to keep the eyes together. The child is then said to have a tendency to turn the eyes in (esophoria), out (exophoria), up (hyperphoria), or down (hypophoria). At times the child might not be able to keep the eyes working together and goes between a phoria and a tropia. This condition is called an intermittent tropia.

Muscle imbalances run in families, and most of the time are not associated with any other physical problem. In some cases, muscle imbalances occur when a nerve to the muscle is damaged, when the part of the brain that controls eye movement is damaged, or when one eye has poorer visual acuity than the other.

Treatment for strabismus depends on what causes it. Most muscle imbalances can be treated with glasses, eye drops, surgery, and in some cases eye exercises.

6. Nystagmus

Nystagmus is a name for a condition that causes the eyes to move in a rhythmic, jerky manner. The eyes of most people with nystagmus move from side to side. Other people have eyes that move up and down, in a circle, diagonally, or in a combination of directions. It can be associated with other disorders, so children with nystagmus should be seen by an eye care provider as early as possible.

A child with nystagmus does not see objects moving, but does have blurred vision. The child may be able to quiet the eye movements by holding the head and eye in a certain direction, thus getting better visual acuity.

7. Cataracts

Cloudiness in a part of the eye called the lens is called a cataract. This cloudiness scatters light as it enters the eye or keeps light from entering the eye. It is important for a young child with cataracts to be treated early, so that the visual system can develop normally. Cataracts can be caused by illnesses that the mother has during pregnancy and from certain drugs used during pregnancy. It can be a part of a syndrome such as Down or Marfan’s. Cataracts can be treated by surgery. Afterwards, a child must wear a contact lens or glasses (if cataracts were removed from both eyes) to focus properly. Older children may be treated by a surgical procedure that involves implanting a lens within the eye (intraocular lens implant).
8. **Retinal detachment**

   The retina is a thin layer of tissue that lines the inside of the eye. Retinal detachment occurs when part of the retina is separated from the back of the eye and loses its source of nourishment. Blindness develops in the area of the visual field that relates to the part of the retina that is separated.

   Retinal detachment can be caused by several conditions. Some examples are severe head injury, as seen in child abuse or shaken baby syndrome, or direct trauma to the eye. Usually surgery is needed and, if successful, some of the vision is restored.

9. **Retinopathy of prematurity (ROP)**

   ROP is a condition which can cause retinal damage, including detachment, in babies who are born several weeks before their due date. It appears to occur most often in infants with a low birth weight who have received oxygen over a long period of time. When the retina is not fully developed, it is more likely to form abnormal blood vessels and tissue that can lead to retinal detachment. Laser surgery can be used in some cases to treat the retina and prevent retinal detachment; sometimes the retina detaches anyway, and more extensive surgery is required. It is important to follow a child who has been treated for retinopathy of prematurity, because the child remains at high risk for developing problems with visual acuity, muscle imbalances, and retinal problems in the future.

10. **Retinoblastoma**

    Retinoblastoma is the name of a malignant eye tumor that can cause death if it is not treated. Most retinoblastomas occur in children under three years of age. It is usually found when a doctor examines the eyes and notices a difference in the reflex coming from the back of each eye. It may not be noticed until it causes the eye to look cloudy or until the child develops a muscle imbalance. If the tumor is found very early, it is possible to shrink it with radiation. Sometimes, some vision can be saved. Often, the eye must be removed. An artificial eye can be placed in the eye socket to give the child a more natural appearance. Retinoblastoma can be hereditary.