



UNIVERSITY
OF WYOMING

College of Health Sciences
Wyoming Institute
for Disabilities

PRESCHOOL AGE VISION SCREENING *Handbook*



Current evidence-based practices based on those published by the National Expert Panel to the National Center for Children’s Vision and Eye Health and the expertise of the Wyoming Pediatric Advisory Committee made up of optometrists from around the state guided the directions in the enclosed vision screening handbook. It represents the current vision screening recommendations for children 3-5 years old. The Wyoming Vision Collaborative is housed within the Wyoming Institute for Disabilities (WIND).

Authors: Julia Lausch, Dr. Amy Aldrich, Dr. Nathan Edwards, Canyon Hardesty, Dr. Ashlee Mills-Fischer,
Dr. Chris Loe, Dr. Dana Day, Dr. Jaime Hazen, Dr. Jessica Albers, Dr. Sue Lowe, and Hannah Ginn

Content reviewed and updated by Dr. Amy Aldrich (2024)

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PRESCHOOL VISION SCREENING *Handbook*

INTRODUCTION

The Wyoming Vision Collaborative united key Wyoming stakeholders and professionals in an ongoing process to establish a coordinated system of education, training, referral, and family support around childhood vision health. Our stakeholder network worked to establish a state-wide program with a high level of buy-in and program consistency. This program aimed to increase the rates of vision screening and appropriate follow-up for children 3 through 5 years old, and to increase community education about the importance of vision screening and comprehensive eye exams. Our approach is in line with the American Academy of Optometry's Policy Statement, recommending a continuum of care (with vision screenings and exams) to ensure early detection and treatment of vision disorders.

The vision screening recommendations in this handbook are indicated for children 3 through 5 years old. For children younger than 3, a comprehensive eye exam with an eye care provider is recommended. Photo screening is also performed for children beginning at 12 months old as indicated by the AAP Clinical Report, but little evidence supports its accuracy. (*Please note, children 6-12 months old can receive a free comprehensive eye exam with an eye care provider who participates in the InfantSee program. Families are encouraged to call ahead of time to their preferred office to confirm that the provider's participation in InfantSee is current.)

Handbook

OVERVIEW

This handbook will describe the procedure for completing a vision screening in accordance with recommendations provided by the Wyoming Pediatric Advisory Committee.



THE HANDBOOK ADDRESSES THE FOLLOWING:

- Importance of vision screening and eye examinations
- Vision screening guidelines
- Procedures for the following types of screening tests:
 - Visual Acuity
 - **VIP single crowded LEA Symbols® Visual Acuity Screening test at 5 feet or 10 feet**
 - **HOTV**
 - Stereopsis
 - **Stereo Smile (PASS 2) Stereotest**
 - Color vision testing
 - **Color Testing Made Easy**
 - Instrument-based screening
 - **Retinomax, plusoptiX, Welch-Allyn SPOT, GoCheck Plus**
- Recommended follow-up procedures
- Glossary of eye conditions

Importance of **VISION SCREENING**

Wyoming's preschool vision screening program is designed to detect common vision problems that can occur during childhood. The program also assists vision screeners in completing follow-up procedures so that children are appropriately referred to eye care providers for diagnosis and treatment of these vision problems. It is important to note that vision screenings do not replace comprehensive eye examinations; comprehensive eye examinations with an eye care provider are strongly recommended for all children. Children with glasses should still be screened, and encouraged to follow their eye care provider's recommendations.

VISION DEVELOPMENT

Vision development begins in infancy and is a lifelong process. As the eyes grow and develop, the brain learns to interpret visual information. Vision involves many things:

- Healthy eyes, free of disease, gather light and visual information.
- Visual skills (eye tracking, eye focusing, and eye teaming) help to coordinate the two eyes.
- The optic nerves of each eye send visual information to the brain.
- The visual cortex of the brain organizes and interprets visual information.
- The visual system integrates with other sensory and motor systems.

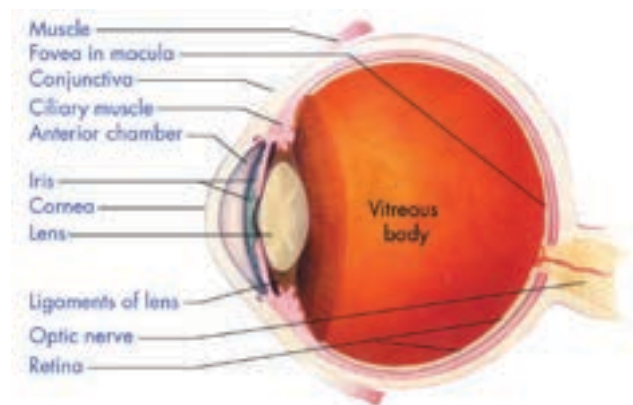


Image courtesy of *Ohio's Preschool Vision Screening Guidelines*.

Without proper visual input in childhood, the brain fails to develop normal vision. This can lead to difficulties with learning, and delay in motor development, as well as challenges with occupations and life skills in adulthood.

VISION AND EYE PROBLEMS DETECTED THROUGH VISION SCREENINGS

Effective vision screening programs can detect many serious possible vision and eye health problems. Early detection leads to early diagnosis and treatment by an eye care provider to prevent lifelong vision problems. Vision screenings and comprehensive eye examinations in childhood will save vision and can even save lives. Common (and not so common) vision and eye problems that can be detected include:

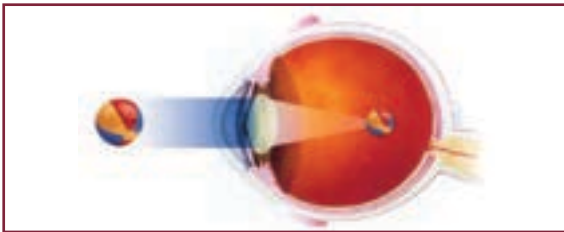


Image courtesy of *Ohio's Preschool Vision Screening Guidelines*.

Refractive Error (myopia, hyperopia, astigmatism): conditions in which light is not focused properly. If not corrected, refractive error can cause blurry vision and may lead to amblyopia.



Amblyopia (“lazy eye”): poorly developed vision in one or both eyes. If left untreated in childhood, amblyopia can result in permanent vision loss.



Strabismus (“eye turn”): a misalignment of the eyes that results in poor depth perception and can cause amblyopia.



Serious (and sometimes life-threatening) eye health problems such as cataracts or eye cancer.

See Appendices C and D for more information

Resources Needed **FOR SCREENING**



PERSONNEL

- Ideal: 3 certified vision screeners
- Optional: 1 certified vision screener with several volunteer assistants

GENERAL SUPPLIES

- Clipboards
- Measuring tape or yard stick
- Masking tape or painters tape
- Pencils, paper clips and stapler
- Plain paper to tape behind wall chart, if necessary, to provide uncluttered background, or for covering windows to reduce glare
- Two small tables, one for the recorder and the other for screening materials
- Three chairs for screener, recorder and chart attendant
- Four chairs for children being screened
- Wastebasket and trash bags
- Rubbing alcohol or antibacterial wipes

VISUAL ACUITY SUPPLIES

- Visual acuity test (VIP single, crowded LEA Symbols® Visual Acuity Screening test system at 5 feet or 10 feet) or HOTV
- Masking tape or Happy/Magic Feet for preschoolers to mark a distance of 5 feet
- Occlusion equipment:
 - Occluder glasses

- Patches:
 - Best practice: single-use adhesive patches
 - Alternative options: “pirate patch” for children without glasses, “slip-on” patches for children with glasses

STEREOPSIS SUPPLIES

- Test kits: Stereo Smile (PASS 2) Test
 - For the Stereo Smile (PASS 2) test, the kit includes polarized glasses
- Masking tape or Happy/Magic Feet for preschoolers to mark testing location

COLOR VISION SUPPLIES

- Color Testing Made Easy assessment kit by Dr. Terrace L. Waggoner
- Pointer, such as a Q-tip, popsicle stick, or pencil eraser

INSTRUMENT-BASED SCREENING SUPPLIES

- Device: Retinomax, plusoptiX, SPOT, GoCheck Kids
- Printer and paper
- Extension cords and fully charged batteries for devices
- Optional:
 - Computer and manufacturer recommended software for the chosen photo screening device. Some printers are specifically matched with the photoscreeners so that printing is possible straight from the device without a computer.

OPTIONAL

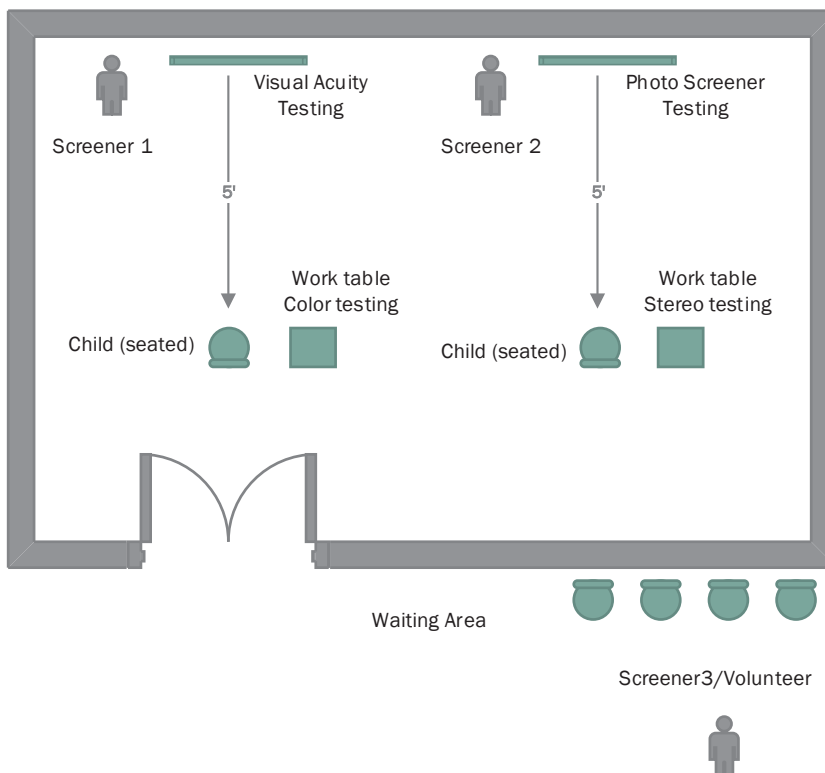
- Name tags for screeners
- Lamps, if needed, to properly light the chart
- Tissues
- Rewards such as stickers, coloring pages and ribbons

SPACE REQUIREMENTS FOR SCREENING

- Quiet area, free from distractions
- Room with sufficient space to permit viewing the acuity chart test without obstruction
 - Approximately 12 feet of space for a 10 foot chart
- Uncluttered, non-patterned, light colored wall
- Appropriate lighting without shadows or glare

RECOMMENDED SCREENING ROOM SET-UP

Each location's set-up will vary. The chart below is provided to help demonstrate a visual sample of *one way* to set-up a screening. The photo screener will require low light, with light sources preferably located behind the individual being screened. Too much light will prevent the machine from getting a good reading. Consider keeping a black umbrella on hand to provide extra protection from lights that can impact the performance of some vision screening instruments. This must be balanced with having enough lighting for children to properly see the visual acuity chart.



If you are unable to have the waiting area outside the screening room, have waiting area chairs angled so 1) children do not have a direct line of sight to the screening tests and 2) children being screened are not distracted.

Personnel

RESPONSIBILITIES

All screening personnel should undergo a comprehensive training program, preferably with standardized training and certification in the screening methods to be used.

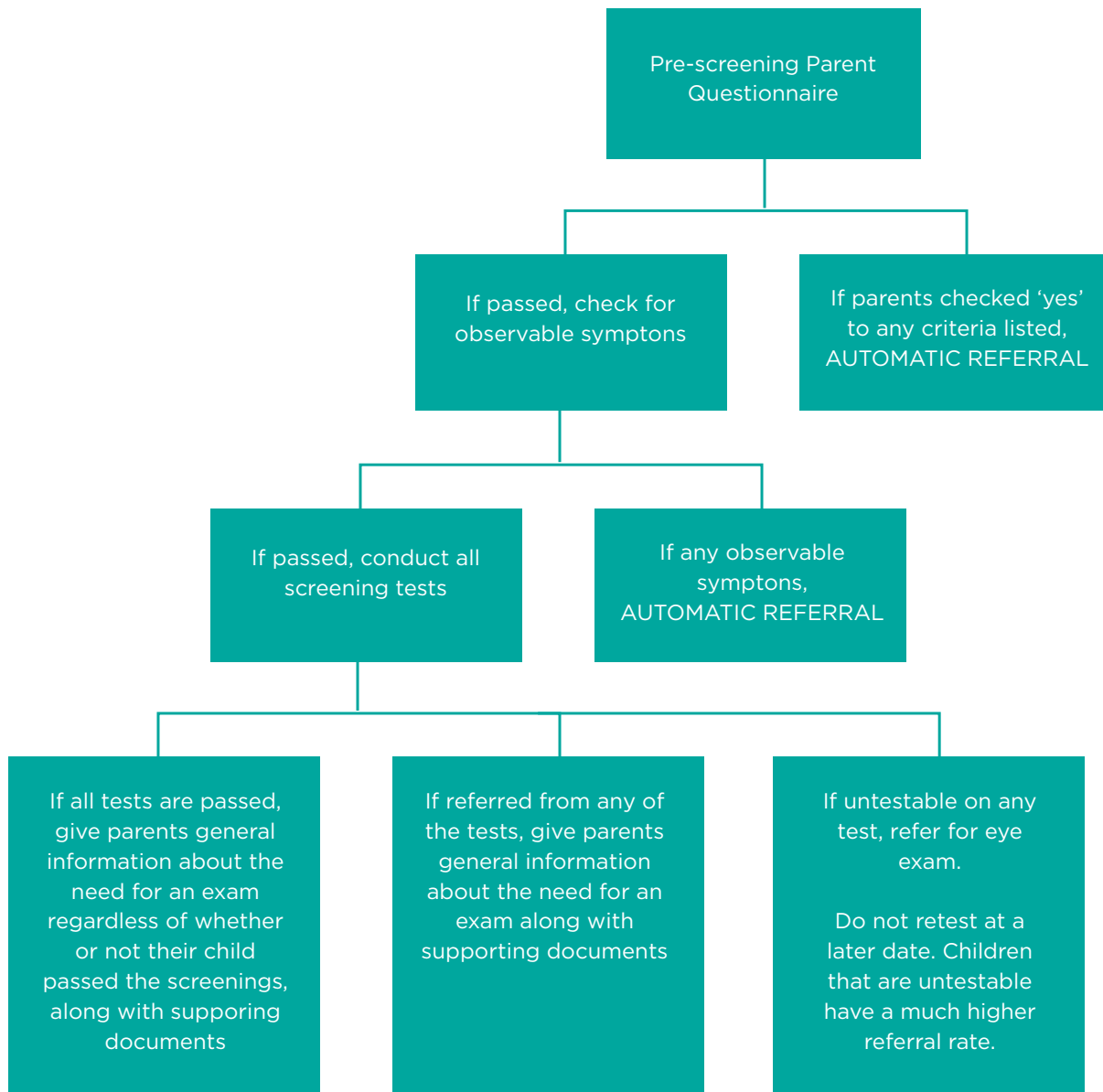
CERTIFIED VISION SCREENER RESPONSIBILITIES

- Manage the overall screening
- Assist in setting up the screening area
- Greet children; establish rapport with them
- Observe signs of potential vision problems
- Follow the pass and referral criteria for screening as established by the screening program guidelines
- Screen the children
- Watch for proper occlusion during visual acuity testing

STAFF/VOLUNTEER RESPONSIBILITIES

- Assist in setting up screening area
- Direct the child's attention to the screening test
- Watch for proper occlusion during visual acuity testing
- Assist the certified screener in observing signs of potential vision problems
- Assist in setting up screening area
- Complete forms, noting screening results and recommendations
- Assist the certified screener in observing for signs of visual difficulties

Vision Screening PROCEDURES



STEP
ONE

PAPERWORK

Collect the **permission slip** for the child being screened. Ensure that all the required information is completed. This is especially important for follow-up purposes and to ensure proper HIPAA (Health Insurance Portability and Accountability Act) guidelines are followed for the consent of the parents. If your site supports **opt-in or opt-out** screening, please make sure that the **parents were properly informed** about the program and that the child being screened was not requested to be left out of the screenings.



STEP
TWO

PRE-SCREENING REFERRAL

Some children should be automatically referred for comprehensive eye examinations and not screened.

1. Automatic referral based on: **Parent Questionnaire**
The Parent Questionnaire is a form that will be sent home to a child's parent or guardian prior to conducting the screening. The various characteristics or symptoms listed on this form represent circumstances in which children have much higher rates of eye health problems. Therefore, if any of these conditions are present (**If the parent checked 'yes' to any of the asked questions**), the child should **not** be screened and instead should be **automatically referred** to an eye care provider for a full exam.
2. Automatic referral based on: **risk factors for vision and eye health problems**
Many risk factors exist that increase a child's likelihood of having a vision or eye health problem. If one of these risk factors is present, the child should be automatically referred for a comprehensive eye exam with an eye care professional.
 - **Family History:**
 - Parent/guardian suspects eye or vision problem
 - Family member with known eye health condition such as:
 - amblyopia (lazy eye)
 - strabismus (eye turn/misalignment)
 - genetic eye disease
 - low vision
 - **Prenatal Risk Factors**
 - Maternal smoking during pregnancy
 - Maternal disease or significant complication during pregnancy
 - **Prematurity**
 - Premature birth (<32 weeks gestation)
 - Low birth weight (<1500g or 3.3lbs at birth)
 - Oxygen use after birth
 - **Genetic Syndromes and Systemic Conditions**
 - Down Syndrome

- Collagen disorders (Ehlers-Danlos, Pseudoxanthoma, Elasticum, Marfan's Syndrome)
- Motor abnormalities such as cerebral palsy
- Hearing impairment
- Speech impairment or delay
- Autism Spectrum Disorder
- Diabetes
- Autoimmune disorders
- Cognitive impairment
- Cystic impairment
- Cystic fibrosis
- Chromosomal abnormalities
- Skin disorders (eczema)
- Craniofacial abnormalities
- Neurologic disorders (Sturge-Weber, neurofibromatosis)
- Thyroid disease
- Seizures
- Genetic abnormalities (Albinism)
- Leukemia
- Cancer
- Metabolic Disorders (Fabry's Disease, Wilson's Disease, galactosemia)
- Brain Damage (hydrocephalus, tumor, head injury, skull malformation)
- **Medications**
 - ADD/ADHD medications (Adderall, Ritalin, Concerta, Strattera, Vyvanse)
 - Anti-seizure medications (Depakote, Keppra, Ativan, Dilantin, Topamax)
 - Respiratory medications (Advair, Nasonex, Flonase)
- **Examinations**
 - Physical examination (observation) shows eye abnormality
 - Prior eye examination requiring follow-up

3. Automatic referral based on: **testability**

Any child that is untestable, or very difficult to test due to a lack of cooperation or unreadable results should be automatically referred for an eye exam as they are statistically much more likely to need treatment from any eye care professional.

Any child that is automatically referred for a complete eye exam receives all listed paperwork, including a copy of their consent form, to give their eye care provider showing written permission for the eye care provider to release information about the examination findings back to the screening entity.

STEP THREE

OBSERVABLE SIGNS

First, a screener checks the child's eyes for signs of problems. See below for a complete list of observable symptoms to assess. If any of these problems exist it is recommended that the child **automatically be referred**.

ABCS OF POTENTIAL VISION/ EYE PROBLEMS: APPEARANCE, BEHAVIOR, COMPLAINT

APPEARANCE SIGNS

- Crossed eye or wandering eye (turning in, out, up, or down)
- Watering eyes
- Red-rimmed, encrusted or swollen eyelids (including styes or bumps)
- Drooping eyelid. Ptosis, commonly called drooping eyelid, is observed as the sagging of one upper eyelid to partially or completely cover the eye.
- Presence of white pupil. This can be associated with a rare but serious eye disease. The white pupil may be observed when looking directly at the individual's eyes, or in his or her photograph.
- Difference in pupil sizes or irregular pupil shape
- Possible eye injury. Watch for eyes that are reddened, bloodshot, blackened, bruised or swollen, or show evidence of lacerations or abrasions.

BEHAVIOR SIGNS

- Body rigid when looking at objects
- Thrusting head forward or backward while looking at objects
- Tilting or turning of the head to one side
- Trying to peek around occluder or resisting occlusion
- Squinting or frowning
- Excessive blinking
- Closing or covering one eye
- Avoidance of having one eye covered and stop participating/cooperating
- Frequent rubbing of the eyes
- Unwilling to participate

COMPLAINT SIGNS

- Headaches, nausea or dizziness (Does your head/tummy hurt? Do you feel like you will fall down?)
- Blurred or double vision (Is it hard to see all the parts of the picture?)
- Burning, scratchy or itchy eyes (Do your eyes hurt/feel itchy?)
- Sees blur when looking up after close work (Is it hard to see all the parts of the picture when you look up at it?)
- Unusual sensitivity to light (Does the light in here hurt your eyes?)

STEP FOUR

VISUAL ACUITY



Vision in Preschoolers (VIP) Single crowded LEA Symbols Visual Acuity Screening test at 5 feet (left), Eye occluders including single-use adhesive patches (center) and occluder glasses (right)

Images courtesy of good-lite.com

ABOUT THE TEST

Visual acuity is defined as the ability to discern fine visual differences. This screening will assess distance visual acuity. The screener should use the Vision in Preschoolers (VIP) Single crowded LEA Symbols Visual Acuity Screening test at 5 feet or 10 feet to assess visual acuity. The symbols on the LEA chart are: circle, square, house, and heart. Visual acuity testing can identify significant eye diseases such as amblyopia (poor vision in one or both eyes), myopia (nearsightedness), hyperopia (farsightedness), astigmatism (blurred vision), anisometropia (unequal prescription). The HOTV visual acuity test is also an acceptable best-practice screening tool. Children identify large "H", "O", "T", and "V" letters on a chart.

Below are the equipment and procedures for the VIP test. Please note that directions and procedures are similar if using the HOTV test.

VISUAL ACUITY SET-UP

Equipment:

- Vision in Preschoolers (VIP) Single Crowded LEA Symbols Visual Acuity Screening Test at 5 feet or 10 feet test set
 - Crowded LEA SYMBOLS® Disk Card with Masking Window for 3 year olds
 - Crowded LEA SYMBOLS® Disk Card with Masking Window for 4 and 5 year olds
 - Baseline Flip Book
 - LEA SYMBOLS® Response Key (Lap Card)
 - Cord to measure testing distance
- HOTV may be used as well
- Occlusion method (see next page)

- Alcohol swabs (for occluder glasses)
- Chair(s) for child and screener
- Distance between the child's eyes and the chart:** 5 (or 10) feet
- Lighting:** normal room lighting with minimal glare or shadows on testing cards
- Personnel:** 1-2 individuals
 - One person holding the Disk Card and baseline flip book
- Occlusion:** Each eye is tested individually. To occlude the eye not being tested, the following occlusion methods are recommended:
 - Best Practice: single-use adhesive patches
 - Alternative options: “pirate patch” for children without glasses, “slip-on” patches for children with glasses

VISUAL ACUITY TEST PROCEDURES

- STEP 1: Measure Distance from Testing Cards**
 - Seat the child 5 (or 10) feet away from the testing cards (you can either use the black cord enclosed in the screening kit, or measure out 5 (or 10) feet with a tape-measure to accurately mark the distance on the floor with tape). The child should wear his or her own glasses, if applicable.
- STEP 2: LEA or HOTV Symbol**
 - Give the child the response key (lap card). Have the child name each LEA or HOTV symbol.
 - Note:
 - The child can mis-identify the LEA symbols, as long as their mis-identification of each symbol is consistent.
 - If the child is non-verbal or cannot name the symbols, they can still complete the test by pointing to and matching the symbols.
- STEP 3: Test the Right Eye**
 - To test the right eye, place occlusion over the left eye. During testing, constantly monitor for any attempts to peek around the occluder (removal of occluder, tilting or turning of the head, body movement).
- STEP 4: Baseline Flip Book**
 - Hold up the baseline flip book for the right eye and have the child identify all four cards from the 5 (or 10) foot test distance.

STEP 5: Disk Card

- Use the Disk Card for the correct age of the child. There are two separate Disk Cards, one for 3 year olds, and one for 4 and 5 year olds.
- If testing a 3 year old's right eye, position the wheel at 3R1. If testing a 4- or 5-year old, position the wheel at 4R1.
 - 3R1:
 - 3 stands for 3 year olds
 - R stands for Right eye
 - 1 stands for the first LEA symbol
- Have the child identify all 8 LEA symbols by turning the wheel clockwise. They may verbally identify the symbols or match the symbol on their lap card.
- Starting from the top line, the screener asks the child to identify the first optotype on the RIGHT side of the chart, moving down the lines until an optotype is missed.
- If the child correctly identifies 4 of 5 optotypes on the line, the screener moves down to the next line and asks the child to identify the optotypes. Continue to move down the lines on the right side of the chart until the child is unable to identify 4 out of 5 letters on a line

STEP 6: Repeat for Left Eye

- To test the left eye, place occlusion over the right eye and repeat steps 4-5, but uses the LEFT side of the chart..

VISUAL ACUITY REFERRAL CRITERIA

LEA:

If a child misses 2 or more symbols when identifying the baseline cards, OR if a child misses 2 or more symbols on the Disk Card during the test for either the right or left eye then a referral is made.

HOTV:

If a child does not meet the age-specific passing criteria for their age group on either eye then a referral is made.

STEP FIVE

STEREOPSIS



PASS 2 (Stereo Smile) Test

Images courtesy of good-lite.com

ABOUT THE TEST

The objective of stereopsis testing is to assess an individual's depth perception and ability to use the two eyes together. Stereopsis testing can identify significant eye diseases such as strabismus ("eye turn") and amblyopia (poor vision in one or both eyes). Testing for stereopsis is optional per current guidelines.

Testing is performed with the PASS 2 (Stereo Smile) Test. Instructions are included below.

HELPFUL HINTS

- The child should wear his or her own glasses, if applicable
- Don't touch the testing cards or glasses, as finger oils can ruin the cards and glasses
- Minimize movement of the testing cards and the child's head

PASS 2 (STEREO SMILE) SET-UP

- **Equipment:** PASS 2 testing plates, polarized glasses
- **Lighting:** Normal light, minimal glare on testing cards
- **Personnel:** 1 individual sitting approximately 2 feet directly in front of the child

PASS 2 (STEREO SMILE) PROCEDURE

STEP 1

- Put the polarized glasses on the child. If the child wears glasses, the polarized glasses should be placed over the child's own glasses.

- STEP 2**
 - Present Card A (demonstration card) at eye level and 16 inches from the child's eyes. Tell the child that the smiley face is "popping" off the card. Ask the child to point to the smile to ensure that they child can identify the smile.
- STEP 3**
 - Present blank card and Card B side-by-side at eye level and 16 inches from the child's eyes. Have the child point to the smile (should point to Card B).
- STEP 4**
 - Shuffle the cards and present the cards 4 more times. The child should correctly identify the smile at least 4 of 5 times to "pass". (Do not use Card C.)

STEREOPSIS REFERRAL CRITERIA

The child is referred if they cannot correctly identify Card B on 4 out of 5 presentations.

STEP SIX

STEP SIX: COLOR VISION



The new (left) and old (right) version of the Color Vision Test Made Easy test.
Please note, only the packaging has changed.

Images courtesy of konanmedical.com and Amconlabs.com

ABOUT THE TEST

Some individuals may not be able to distinguish between certain colors. Color vision defects are typically genetic and occur in approximately 8% of males and 1% of females. The object of this test is to identify these children. This is optional per current guidelines.

HELPFUL HINTS

- The child should wear his or her own glasses, if applicable
- Don't touch the testing cards, as finger oils can ruin the cards. Use a pointer if the child needs to point to or trace the shapes.

COLOR VISION SET-UP

- **Equipment:** Color Vision Testing Made Easy booklet
- **Lighting:** Normal light, minimal glare on booklet
- **Personnel:** 1 individual sitting approximately 1 foot directly in front of the child

COLOR VISION PROCEDURE

- STEP 1**
 - Present the demonstration card to the child. Ask the child to tell you what

shapes they see. Alternatively, you can have the child use a pointer to trace or point to each shape. (Ask: “*Can you point to the big circle?*”)

STEP 2

- Repeat Step 1 with Cards 1-9.

COLOR VISION REFERRAL CRITERIA

The child is referred if they cannot correctly identify all shapes on Cards 1-9

COLOR VISION OPTIONS

It is recommended that the complete procedure, outlined above, be performed.

However, if time constraints exist, the following options are possible to expedite the color vision screening:

1. Only screen boys, as color vision defects are far more common in males
2. Only use the following cards: demonstration card and cards 2, 3, 4, 7, 8, 9

STEP
SEVEN

INSTRUMENT-BASED SCREENING

Retinomax:



*Images courtesy of
righton-oph.com*

plusoptiX:



*Images courtesy of
schoolnursesupplyinc.com
and goldenlionsclub.org*

SPOT:



*Images courtesy of
welchallyn.com and olshf.org*

GoCheck Plus:



*Images courtesy of
gocheckkids.com and
impactfoundation.org*

ABOUT THE TEST

Automated devices (photoscreeners and autorefractors) are used to assess a child's eyes to determine if there are structural issues that are consistent with a refractive error or other significant vision problems. The device DOES NOT provide a measure of visual acuity. Most of these devices screen for anisometropia (unequal prescription), astigmatism (blurred vision), hyperopia (farsightedness), myopia (nearsightedness), anisocoria (unequal pupil size) and strabismus ("eye turn"). The devices have pre-set guidelines for determining pass and refer criteria. These are screening tools, not comprehensive diagnostic devices.

- **Advantages:** The test is fast, and doesn't require interpretation of results (device determines pass or refer).
- **Disadvantages:** These devices are expensive and are only designed to detect age-related refractive errors, not including other vision or eye conditions. When other conditions are present, the device may yield an inconclusive result to indicate a referral, and they may miss some vision and eye conditions.

INSTRUMENT-BASED SCREENING SET-UP

- **Equipment:** device of choice, charged batteries, power supply, printer
- **Distance between the child's eyes and the device:** approximately 3 feet (varies based on device used)
- **Lighting:** dim room lighting
- **Personnel:** 1 individual

INSTRUMENT-BASED SCREENING PROCEDURE

- STEP 1**
 - Enter the child's information into the device, following manufacturer instructions.
- STEP 2**
 - Position the child approximately 3 feet from the device. The device should be held at the child's eye level.
- STEP 3**
 - Instruct the child to look at the device and follow manufacturer instructions to obtain reading.

INSTRUMENT-BASED SCREENING REFERRAL CRITERIA

Device indicates "Refer"

Note: Do not re-take if it indicates "refer". A child's eyes can adjust and give an inaccurate result in later attempts.

Note: If the device reads 'inconclusive' and you have a good picture of the child's eyes (eyes are open with no obstructions, child looking at camera, picture is level), refer the child.

Vision Screening

FOLLOW-UP PROCEDURES

The follow-up procedures are extremely important to ensuring that the hard work of your screening actually makes a difference for the child!

Please note to the parents that even if a child “passes” the screening, **yearly examinations** by an eye care provider such as an optometrist or ophthalmologist, which involve monitoring of eye health as well as vision development, **are strongly advised for all children** to ensure good vision, vision development and eye health.

FOLLOW-UP

Appropriate follow-up care includes up to 2 phone calls within 3 months to families of referred children to inquire if they have seen an eye care professional and if they would like any further resources.



Appendix

Appendix A: Children's vision risk factors

Appendix B: Glossary of vision and eye health problems

Appendix C: Tips for working with preschool children

Appendix D: References

Appendix A

RISK FACTORS FOR VISION AND EYE HEALTH PROBLEMS

Many risk factors exist that increase a child's likelihood of having a vision or eye health problem. If one of these risk factors is present, the child should be automatically referred for a comprehensive eye exam with an eye care professional.

FAMILY HISTORY

- Family member with amblyopia (lazy eye) or strabismus (eye turn/misalignment)
- Family member with known eye health condition
- Parent/guardian suspects eye or vision problem
- Family member with known eye health condition such as:
 - amblyopia (lazy eye)
 - strabismus (eye turn/misalignment)
 - genetic eye disease
 - low vision

PRENATAL RISK FACTORS

- Maternal smoking during pregnancy
- Maternal disease or significant complication during pregnancy

PREMATURITY

- Premature birth (<32 weeks gestation)
- Low birth weight (<1500g or 3.3lbs at birth)
- Oxygen use after birth

GENETIC SYNDROMES AND SYSTEMIC CONDITIONS

- Down Syndrome
- Collagen disorders (Ehlers-Danlos, Pseudoxanthoma, Elastica, Marfan's)

Syndrome)

- Motor abnormalities such as cerebral palsy
- Hearing impairment
- Speech impairment or delay
- Autism Spectrum Disorder
- Diabetes
- Autoimmune disorders
- Cognitive impairment
- Cystic impairment
- Cystic fibrosis
- Chromosomal abnormalities
- Skin disorders (eczema)
- Craniofacial abnormalities
- Neurologic disorders (Sturge-Weber, neurofibromatosis)
- Thyroid disease
- Seizures
- Genetic abnormalities (Albinism)
- Leukemia
- Cancer
- Metabolic Disorders (Fabry's Disease, Wilson's Disease, galactosemia)
- Brain Damage (hydrocephalus, tumor, head injury, skull malformation)

MEDICATIONS

- ADD/ADHD medications (Adderall, Ritalin, Concerta, Strattera, Vyvanse)
- Anti-seizure medications (Depakote, Keppra, Ativan, Dilantin, Topamax)
- Respiratory medications (Advair, Nasonex, Flonase)

EXAMINATIONS

- Physical examination (observation) shows eye abnormality
- Prior eye examination requiring follow-up

Appendix B

GLOSSARY OF VISION AND EYE HEALTH PROBLEMS

AMBLYOPIA (LAZY EYE)

Poor vision development in one or both eyes that is typically caused by high refractive error or strabismus. If detected early, amblyopia is preventable and treatable. If left untreated in childhood, amblyopia can result in permanent vision loss. Amblyopia treatments include: glasses or contact lenses, eye patching, eye drops, and vision therapy.

ANISOCORIA

Unequal pupil sizes. While anisocoria is normal in approximately 20% of individuals, it may also be indicative of potentially serious health conditions or neurologic problems.

CATARACTS

Clouding of the lens inside the eye. When a cataract is present in infants and young children, it is critical that the cataract be removed as soon as possible to allow for proper vision development. After cataracts are removed, children must wear glasses or contact lenses to correct their vision.

COLOR VISION DEFECT

Poor color vision can be genetic (most common) or related to eye disease. Color vision defects typically run in families and are most common in males. There is no treatment for color vision defects.

NYSTAGMUS (DANCING EYES OR SHAKY EYES)

Jerky movements of the eyes in a rhythmic pattern. Nystagmus results in blurry vision. A

person with nystagmus may hold their head in a certain position to help reduce the jerky movements. Nystagmus is often related to other eye and health conditions.

PTOSIS

Droopiness of the eyelid(s). Ptosis may lead to amblyopia and poor vision development if the eyelid covers the pupil. Ptosis is related to other eye and health conditions.

REFRACTIVE ERROR

Occurs when the light entering the eye does not focus properly on the retina (the back surface of the eye). Refractive error typically leads to blurry vision and may require correction with glasses or contact lenses to make vision clear. There are three types of refractive error:

- Astigmatism: light focuses in more than one place, which causes blurry vision at all distances
- Myopia (near-sightedness): light focuses in front of the retina. Myopia causes blurry vision for distant objects.
- Hyperopia (far-sightedness): light focuses behind the retina. Hyperopia causes blurry vision for near objects, and possibly for distant objects as well.

RETINAL DETACHMENT

An emergency condition where the retina (tissue on the back surface of the eye that contains the cells that are necessary for vision) falls away from the back surface of the eye. A retinal detachment must be repaired surgically and requires urgent intervention. Retinal detachments can be genetic, related to eye conditions, or caused by head/eye trauma (falls, child abuse, shaken baby syndrome).

RETINOBLASTOMA

A malignant eye tumor that occurs in young children. Retinoblastoma is often noticed through the appearance of a white pupil – either with direct observation of a child’s eyes or in a photograph. If detected early, retinoblastoma can be treated successfully. If undetected, retinoblastoma is life-threatening.

RETINOPATHY OF PREMATURITY (ROP)

Poor development of the retina (tissue on the back surface of the eye that contains the cells that are necessary for vision) due to premature birth. Children with ROP require close monitoring by eye care providers for development of serious vision and eye health complications.

(LACK OF) STEREOPSIS

Stereopsis is depth perception. Stereopsis only occurs when the 2 eyes are working together as a team. Amblyopia or strabismus can result in poor stereopsis. Stereopsis can be improved by treating the amblyopia or strabismus, or with vision therapy.

STRABISMUS

Eye turn or eye misalignment. Strabismus occurs when the two eyes do not point in the same direction. There are several types of strabismus: esotropia (inward eye turn), exotropia (outward eye turn) or vertical strabismus (upward or downward eye turn). Strabismus can lead to poor vision development, poor depth perception, and amblyopia. Treatment for strabismus may include: glasses or contact lenses, prism lenses, eye patching, vision therapy and eye muscle surgery.

VISUAL EFFICIENCY DEFECTS

Deficiencies in eye tracking, eye focusing and eye teaming. Visual efficiency defects can lead to uncomfortable vision and difficulties with school work, athletics and hobbies.

VISION INFORMATION PROCESSING DYSFUNCTION

Difficulty interpreting and organizing visual information. Poor vision processing can lead to difficulties with development, learning, school work, athletics and hobbies.

Appendix c

TIPS FOR WORKING WITH PRESCHOOL-AGED CHILDREN

Many vision screeners in Wyoming are professionals from the early childhood community and are already experts in working with children. However we have included these tips as an additional resource to make screenings as smooth as possible for both screeners and children.

While performing the screening, it is important to engage the child being screened. In order to eliminate distractions, work with one individual at a time for testing. Make the child comfortable and put them at ease as much as possible. Mirror the child's personality, try to eliminate the child from feeling any sense of failure, have rewards, and most of all, make it fun!

THOUGH EACH CHILD IS A SPECIAL AND UNIQUE INDIVIDUAL, MOST CHILDREN WILL COOPERATE IF SCREENERS FOLLOW SIMPLE GUIDELINES:

- Get on the same level as the child, whether they are standing or sitting. If the screener sits, he or she will be closer to the child's eye level.
- Demonstrate rather than verbalize what is expected whenever possible. Demonstration helps children focus their attention; verbal instruction allows for more distraction. The classroom teacher and waiting-area help can demonstrate the screening "games" with children ahead of time.
- Speak slowly and simply. Try not to overwhelm with important instructions or explanations. Tell preschoolers nicely, but firmly, what you want them to do. Avoid yes or no questions such as "Do you want to ...?" or "Can you see the...?"
- Invite the child to look at and become familiar with the screening equipment
- Engage the child as soon as possible. Give them a job to do: "Will you count to three?" "Will you help me learn these shapes?"

A basic understanding of normal behavior can also be helpful to successfully screen children. Keep in mind that these generalities will not describe every preschool-aged child.

3 YEAR OLDS

- Three year olds have a vocabulary of about 900 words and use sentences of about three to four words. They use the words “mine” and “why” often.
- They may talk a lot and ask many questions. Some may engage the screener in conversation.
- They like to play “make believe” games. Terms like “Magic/Happy Feet” or “pirate glasses” may make the screening more appealing.
- Many have fears, often of strangers and the dark. Remember you are a stranger to the children.
- They enjoy being with friends but do not play and talk with them a great deal.
- They may not yet have steady balance while walking or standing. Some may have difficulty keeping their heels on the line or standing on the “Magic/Happy Feet”.
- They can follow instructions if kept brief and simple words are used.
- They enjoy watching others and attempt to please.

4 YEAR OLDS

- Four year olds have a vocabulary of about 1500 words and use sentences of four to five words.
- They may exaggerate and ask questions.
- They can understand words such as “under, on top of, beside, in back of, in front of.”
- They may be very independent and impatient. Despite their desire to hold their own occluder, the screener should hold the occluder.
- They may rebel if they feel too much is expected of them. Such children may act out, cry, or stop cooperating if unable to see the chart because of a vision problem.
- They may be physically or verbally aggressive. Children who are waiting may become unruly. Keeping the waiting area to no more than five or six children makes it easier to keep children calm and quiet.
- They like to show off and may enjoy entertaining others. They will obey instruction when adults set limits. Explain simply exactly what is expected.

5 YEAR OLDS²

- They have a vocabulary of about 2100 words and use sentences of six to eight words.
- They may talk a lot and ask questions. They are generally curious about factual information. Listen for a brief period and then explain what needs to be done.
- Generally, they are more settled and eager to get down to business than they were at age 4.
- They usually have very few fears.
- They most often try to please. They may try to peek around the occluder to get the right answer.
- They may be very industrious, trying to accomplish a goal and feel pride and satisfaction when the goal is reached. They also sense when they have not succeeded. Use neutral words that encourage effort. Avoid using words that convey right or wrong responses.

2 Borrowed from p. 29-30 of the Prevent Blindness handbook, "Children's Screener basics participant guide".

Appendix D

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CONTACT

Wyoming Institute for Disabilities (WIND)
College of Health Sciences
University of Wyoming
1000 E. University Ave., | Laramie, WY 82071
At the intersection of 9th and Clark Streets
Phone: (307) 766-2441
Fax: 766-2763



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