Vision Screening for
Early Head Start and Head Start

P. Kay Nottingham Chaplin, Ed.D.
kay@good-lite.com   nottingham@preventblindness.org
304-906-2204

Introduction and Disclaimer

• 17 years in vision screening field

• Former Director/Lead Trainer – Vision Initiative for Children – West Virginia University Eye Institute

• Member – Advisory Committee to the National Center for Children’s Vision and Eye Health at Prevent Blindness

• Consultant – Vision Screening Committee, American Association for Pediatric Ophthalmology and Strabismus

• Current Education and Outreach Coordinator for the National Center for Children’s Vision and Eye Health at Prevent Blindness

• Current Director – Vision and Eye Health Initiatives at Good-Lite and School Health Corporation

• Not in sales . . . Focus is encourage age-appropriate, evidence-based, and best practice vision screening as part of a strong, 12-component, Vision Health System of Care
1302.42 Child health status and care

- (2) Within 45 calendar days after the child first attends the program or, for the home-based program option, receives a home visit, a program must either obtain or perform evidence-based vision and hearing screenings.

- (3) If a program operates for 90 days or less, it has 30 days from the date the child first attends the program to satisfy paragraphs (b)(1) and (2) of this section.

“Evidence-Based” Definition from the National Center for Children’s Vision and Eye Health (NCCVEH)

- Definition of “evidence-based” from the NCCVEH: Vision screening tools should be evidence-based, meaning . . .

- Information about the study and effectiveness of the tools were peer-reviewed and published in a scientific journal.

- The screening tools are able to identify targeted vision problems based on data from large-scale screenings performed by comparable screening personnel in typical screening settings, in which all children who pass and fail the screenings also received comprehensive eye examinations conducted by eye care professionals (ophthalmologists, optometrists, pediatric ophthalmologists, or pediatric optometrists).

- Outcomes from the eye examinations were used to validate the performance of the screening tools.

- Simply stating a tool was used to screen 10,000 children does not make the tool evidence-based.

- Stating the tool was used to screen 10,000 children, screening results were compared with eye examination results, and the tool found 90% of children with vision disorders is an example of an evidence-based tool.
Check-off year 1 vision screening tool available at:
http://nationalcenter.preventblindness.org/publications-and-presentations

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• Time for reaching milestones can vary up to 6 weeks . . . except milestone related to straight eyes.

• Slides show when baby should reach milestones.

• Many vision milestones are related to overall developmental milestones . . . want you to think about those milestones from a perspective of vision . . . or how baby’s vision could impact milestone.
1st vision milestone - **ages 6 weeks to no later than 8 weeks**

**Milestone:**
Maintains **stable** eye contact when awake and alert and initiated by parent or caregiver.

**Why important?**
Lack of stable eye contact can interfere with early emotional and general development.

**Questions to Ask or Behavior to Monitor**
Does baby maintain **stable** eye contact when awake and alert and initiated by parent or caregiver?

**What to Do? Next Steps**
Talk close to baby’s face while helping baby to feel parent’s or caregiver’s face.

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2nd vision milestone – **during 3rd and 4th months**

**Milestone:**
Lively communication with social smile.

**Why important?**
Brain is maturing, baby can vary accommodation, baby sees clearly at several distances.

**Questions to Ask or Behavior to Monitor**
When parent/caregiver approaches baby, does baby respond with a smile?

**What to Do? Next Steps**
Refer to pediatric primary health care provider to coordinate an eye examination.
3rd vision milestone – during 3rd or 4th months

Milestone:
Awareness of hands and exploration of hands with mouth.

Why important?
Leads to exploring hands with mouth, which leads to exploring baby’s world.

Questions to Ask or Behavior to Monitor
Does baby bring hands to midline and to mouth?

What to Do? Next Steps
Gently use baby’s elbows to bring hands to midline. Make it a game.

4th vision milestone – by 5th month

Milestone:
Keenly watching hands movements of others; beginning to copy hand movements.

Why important?
Leads to goal-directed reaching and grasping. Begins process of learning from imitation and understanding actions and goals of others.

Questions to Ask or Behavior to Monitor
Is baby keenly watching hands movements of others? Is baby beginning to copy hand movements of others?

What to Do? Next Steps
Refer to pediatric primary health care provider to coordinate an eye examination AND refer to Birth to 3 Early Intervention to help baby observe and begin to copy hand movements of other children and adults.
What to Do? Next Steps
Immediately refer for eye exam to help determine cause of eye misalignment.

Questions to Ask or Behavior to Monitor
Do baby’s eyes ever appear to cross or drift?

Why important?
Eyes must be straight for good binocular vision to develop.

Milestone:
Eyes are straight and do not appear to cross or drift.

5th vision milestone – by age 5 months (no variance on this one)

What to Do? Next Steps
Refer to pediatric primary health care provider to coordinate eye examination AND Birth to 3 Early Intervention for assistance in helping baby develop goal-directed hand-arm movements.

Questions to Ask or Behavior to Monitor
Does baby reach for, grasp object, and look at object when reaching?

Why important?
If baby is not reaching for objects, maybe baby cannot see the objects.

Milestone:
Goal-directed hand-arm movements.

6th vision milestone – during ages 6 or 7 months
7th vision milestone – during ages 7, 8, or 9 months

Milestone: Recognition of family and/or caregiver faces.

Why important?
Baby could be incorrectly diagnosed as being on autism spectrum.

Questions to Ask or Behavior to Monitor
Does baby recognize family members outside the home among groups of people?

What to Do? Next Steps
Encourage family members/caregivers to wear same colorful blouse/shirt or headband when greeting baby each morning.

8th vision milestone – during ages 9 to 12 months

IF baby has been exposed to books

Milestone: Points to individual pictures in a book and vocalizes while pointing.

Why important?
If baby shows no interest in books or does not point to pictures, perhaps baby cannot see the pictures.

Questions to Ask or Behavior to Monitor
When given a book with pictures, does baby point to individual pictures and vocalize?

What to Do? Next Steps
If baby does not respond to the book, try a different book. Perhaps baby is not interested in the first book.
What to Do? Next Steps
Parents and caregivers can encourage baby to eat food with fingers.

Questions to Ask or Behavior to Monitor
Does baby use thumb and first finger to pick up objects?

Why important?
Helps baby to better explore baby’s world in more detail and to improve fine motor skills of hands.

Milestone:
Uses thumb and first finger to pick up objects, such as crumbs on floor.

8th vision milestone – during ages 9 to 12 months
*IF* baby has NOT been exposed to books

Using the Milestones Tool – Case Profile #1

- Child’s age: 5 months
- Developmental skills exhibited:
  - Maintaining stable eye contact initiated by an adult
  - Social smile
  - Exploring hands and putting them in their mouth
  - Watching hand movements of others
  - Eyes drift and cross when tired

- Pass or Refer?
  - _____
Using the Milestones Tool – Case Profile #2

- Child’s age: 9 months
  - Developmental skills exhibited:
    - Maintains stable eye contact initiated by an adult
    - Social smile
    - Exploring hands and putting them in their mouth
    - Watching hand movements of others
    - One eye turns in
    - Goal-directed arm movements
    - Recognizes parents, caregivers, and Grandpa

- Pass or Refer?
  - _____

Using the Milestones Tool – Case Profile #3

- Child’s age: 9 months
  - Developmental skills exhibited:
    - Maintains stable eye contact initiated by an adult
    - Social smile
    - Exploring hands and putting them in their mouth
    - Watching hand movements of others
    - Eyes are straight
    - Goal-directed arm movements
    - Recognizes parents, caregivers, and Grandpa

- Pass or Refer?
  - _____
Years 1 and 2 - Vision Screening Tools

Instrument-based screening

- Instruments do not measure visual acuity
- **Instruments analyze digital images of the eyes to provide information about amblyopia risk factors:**
  - Estimates of significant refractive error (hyperopia, myopia, astigmatism)
  - Estimates of anisometropia
  - Estimates of eye misalignment

Instruments “Approved” by NCCVEH

Welch Allyn®
Spot™ Vision Screener

Plusoptix
S12C Vision Screener

Welch Allyn®
SureSight™
Vision Screener

Disclaimer: These tools are examples of vision screening instruments for this age group. These are not shown for the purpose of sales or promotion.

Preschool-Aged Children: Undetected and Uncorrected Vision Disorders Can Impact Learning

- Squinting in circle time?
- Difficulty sitting still in circle time?
- Coming to the front of the group during reading to look at picture’s in the book?
- Difficulty paying attention during learning activities?
- Clumsy?
### 5th grade – Cs & Ds.
Consistently unruly in class. After VS & glasses, behaviors calmed almost immediately. 3 mo later – Bs & working on As. “You saved my nephew.”

### 2015 study – low-income, ages 3 through 5 yrs – found:
Improvement in academic progress, confidence & behavior - increase in focus during lessons & classroom participation & interaction

### 317 2nd & 3rd graders – 12 high-poverty schools – Baltimore City – Children with uncorrected hyperopia did not perform as well on reading assessments compared with children without hyperopia

### 2015 study – ages 4 and 5 yrs with hyperopia (farsightedness ≥4.0 D) scored significantly worse on early literacy test than children with normal vision

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### Diopter defined

- “Diopter” refers to the strength of a prescription lens required to give a child the clearest vision possible. The higher the number, the stronger the prescription lens.

- A child requiring 4 diopters of correction in prescription glasses, or contact lenses, would likely struggle with blurred vision, crossed eyes, or both, and would see much better with prescription glasses.


True story from Charles Short – Indiana Lions District 25C – West Lafayette, IN

- First grade reading ability found to be predictive of 11th grade reading outcomes, including:
  - Reading comprehension,
  - Vocabulary, and
  - General knowledge.

What do previous slides tell you?

- Importance of:
  - Evidence-based vision screening,
  - Follow-up eye exams,
  - Receiving vision treatment plan and related devices/materials (i.e., glasses, patching); and
  - Following treatment plan for best vision now and in the future.

Evidence-Based Vision Screening Tools & Procedures for Children Ages 3, 4, and 5 Years

- Optotype-Based Screening
- Instrument-Based Screening
Cast of Characters

NCCVEH:
• National Center for Children’s Vision and Eye Health at Prevent Blindness

AAP:
• American Academy of Pediatrics
• American Association for Pediatric Ophthalmology and Strabismus
• American Academy of Ophthalmology
• American Association of Certified Orthoptists

2 Approaches to Vision Screening

1. Optotype-based screening
   • Tests of visual acuity using optotypes to measure visual acuity as interpreted by the brain
     • Quantifiable measurement of the sharpness or clarity of vision when identifying black optotypes on a white background using specific optotype sizes at a standardized distance

2. Instrument-based screening
   • Instruments do not measure visual acuity
   • Instruments analyze digital images of the eyes to provide information about amblyopia risk factors:
     • Estimates of significant refractive error (hyperopia, myopia, astigmatism)
     • Estimates of anisometropia
     • Estimates of eye misalignment (some, not all)
Threshold & Critical Line Screening

• Threshold screening
  ➢ *Move down chart until child cannot correctly identify majority of optotypes*

• Critical line screening
  ➢ *Use only line child needs to pass according to child’s age*

Importance of Appropriate Tools

• “Visual acuity scores can be significantly affected by the chart design.” (p. 1248)
“Not so great” charts . . .

NOT Recommended by NCCVEH and/or AAP

“Sailboat”
Allen Pictures

Lighthouse or “House, Apple, Umbrella”

Snellen

Tumbling E
Why NOT Recommended?

- The use of validated and standardized optotypes and acuity charts is important for an accurate assessment of vision.
- Children may not know their letters.
- Requires discrimination of direction, which is not sufficiently developed in preschool-aged children.
- Charts not standardized.
- Not well validated in screening environment.


Tips:

- Line outside optotypes
- 20/32 vs. 20/30
- 10 feet vs. 20 feet

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Preferred Optotypes for Ages 3 to 7 Years

- NCCVEH
- AAP
- Recommend LEA SYMBOLS® and HOTV letters as optotypes


Preferred Optotype Format

NCCVEH national guidelines call for using single, LEA SYMBOLS® or HOTV letter optotypes surrounded with crowding bars for children ages 3, 4, and 5 years at 5 feet

Options: Critical Line Screening at 10 feet

Sight Line Kit


Also acceptable . . .
Screening Distance

- 5 or 10 feet from chart to child's eyes
- Arch of foot on line (NOT heels or toes to the line) or back of chair (with child's back to back of chair)

Occluders – Younger Children <10 Years
Unacceptable Occluders Ages 3, 4, and 5 years

- Hand
- Tissue
- Paper or plastic cup
- Cover paddle

Why unacceptable?

Children can easily peek


To Point or Not to Point . . . ?

- Pointing to each optotype to help children know where they are on the chart is permissible.
  - True or False?
  - True

  - 1.8 “Line-by-line isolation or pointing may be used, but not letter by letter

**No Pointing at Optotypes**

- Holding pointer at optotype makes optotype easier to identify.

- Instead . . . briefly point under or over top of optotype and quickly remove pointer.

- If line has a box around optotypes, stay outside the box with pointer.

- “Untestable” is not a failed vision screening.

- Keep track of “untestable” children.

- Untestable children in VIP study were 2x as likely to have vision problems than those who passed vision screening.

- If possible, rescreen untestable children same day.

- If you have reason to believe that the child may perform better on another day, consider rescreening the child no later than 6 months.


Referral Criteria

NCCVEH
- Age 3 years:
  - Majority of optotypes on 20/50 line
- Ages 4 and 5 years:
  - Majority of optotypes on 20/40 line
- Ages 6 years and older:
  - Majority of optotypes on 20/32 line

AAP
- Age 3 years:
  - Majority of optotypes on 20/50 line
- Ages 4 years:
  - Majority of optotypes on 20/40 line
- Ages 5 years and older:
  - Majority of optotypes on 20/32 (or 20/30) line
  - Or 2-line difference even in passing lines (i.e., 20/20 and 20/32)

Referral Criteria


Choices for Near Vision Screening

Can do critical line only with both eyes open or one eye at a time.
2 Approaches to Vision Screening

1. **Optotype-based screening**
   - Tests of visual acuity using optotypes to measure visual acuity as interpreted by the brain
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2. **Instrument-based screening**
   - Instruments do not measure visual acuity
   - **Instruments analyze digital images of the eyes to provide information about amblyopia risk factors:**
     - Estimates of significant refractive error (hyperopia, myopia, astigmatism)
     - Estimates of anisometropia
     - Estimates of eye misalignment

**Instrument-Based Screening**

- Use beginning at 12 months; better success at 18 months (AAP)
- Use instruments OR tests of visual acuity for children ages 3, 4, and 5 years (NCCVEH and AAP)
- FYI - Instruments at any age for 6 years and older if child or young adult cannot do test of visual acuity (AAP)

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Instrument-Based Screening

• If use instruments, no need to also do visual acuity screening unless you want to check both VA and refractive error.

• If cannot “capture” a pass or refer result... refer child for comprehensive eye exam.

Instruments “Approved” by NCCVEH

Welch Allyn® Spot™ Vision Screener

Plusoptix S12C Vision Screener

Welch Allyn® SureSight™ Vision Screener

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Report and Information from Prevent Blindness:

- A complete list of public health reports available from Prevent Blindness
- Children’s Vision and Eye Health: A Snapshot of Current National Issues
- Eye health and safety information
- Our Vision for Children’s Vision, A National Call to Action for the Advancement of Children’s Vision and Eye Health
- Prevent Blindness Statement on School-Aged Vision Screening and Eye Health Programs

- Eight Key Vision Development Milestones to Monitor from Birth to First Birthday
- Vision Preservation and the National Prevention Strategy: A call to Action
- Vision screenings and eye exams–complimentary public health approaches for vision

Professional Development

Provider education tools

Parent/family resources

Technical assistance

Communication tools

http://nationalcenter.preventblindness.org
Children’s Vision Health
How to Create a Strong Vision Health System of Care
by P. Kay Nottingham Chaplin, Jean E. Ramsey, and Kim Baldonado

Research suggests that up to 3 in 20 preschool-aged children may have a vision problem that can lead to permanent vision loss if not detected and treated early — preferably before age 5 years (Galdino, 2006). Head start, Early Head Start, and early childhood programs screen children in a proactive manner to help detect these children, who can then be referred to an eye care professional for diagnostic and treatment.

To assist other care providers, Dr. Nottingham-Chaplin offers a choice of resources, from four-screen images and benchmark images from each eye. Any conditions that interfere with this development can cause visual loss (known as amblyopia or “lazy eye”). Four common conditions that can lead to amblyopia include:

1. Strabismus (i.e., crossed eyes) crossing consistently after age 4 to 6 months (American Academy of Ophthalmology, 2017).


Vision and Eye Health
Moving into the Digital Age With Instrument-Based Vision Screening

P. Kay Nottingham Chaplin, EdD
Kire Baldonado, BA
Amy Hutchinson, MD
Bryan Moore, OD

Significant advancements in screening technology are leading to improved design, functionality, and reliability of screening tools. Recently, two new screening approaches are available to school nurses: the children ages 3 years and older (ophtalmic-based screening and instrument-based screening). Ophthalmic-based screening identifies levels of visual acuity usingoptotypes (e.g., pictures, letters, and numbers) which children identify to determine visual acuity. Instrument-based screening identifies visual acuity by automated devices that measure autorefractive indices, such as digital eyes, camera opacities, and eye coherence. The two new approaches enhance the traditional screening process and offer an additional level of information if children are considered “at risk” because they are not included in screening exams.

Instrument-Based Screening
Optical-related devices, automated screening instruments, or automated vision screening devices offer increased technology to provide an estimation of refractive error and information that may be used for consultation with the child’s vision care provider. These devices can be placed in two categories: non-contact lens-free devices and handheld,non-contact devices.

Year of Children’s Vision

- [http://nationalcenter.preventblindness.org/year-childrens-vision](http://nationalcenter.preventblindness.org/year-childrens-vision)
- Archived vision screening webinars in Resources

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Resources to Support Families...

- Financial Assistance Programs
- VS Referral Documents
- Parent Education

http://nationalcenter.preventblindness.org/resources-2

- Tips for Wearing Eye Glasses - https://www.preventblindness.org/your-childs-glasses
- Eyes That Thrive: http://www.preventblindness.org/eyes-thrive
- Book

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Helpful info and statistics for grant proposal writing.


NASN Vision and Eye Health Resource

(National Center for Children’s Vision and Eye Health and NASN partnership)

https://www.nasn.org/nasn-resources/practice-topics/vision-health
Prevent Blindness North Carolina (PBNC), also known as the National Society to Prevent Blindness - North Carolina Affiliate, Inc., was organized in 1967 as a nonprofit health agency. An independent affiliate of Prevent Blindness America (founded in 1900), PBNC delivers direct service programs designed to preserve sight through screening, publications, safety education, information and referral through volunteer efforts. PBNC’s mission is to reach people before blindness strikes.

https://nc.preventblindness.org/  Phone: 919-755-5044

For information about PBNC’s Certification Training Program, email us at: training@pbnc.org

For general inquiries, email us at: info@pbnc.org