



**Closing the Student Vision Health Loop- Screening, Exams, and Follow Up to Eye Care**

NASN Annual Conference June 24, 2015



**Today's Objectives**

At the completion of this panel presentation you will be able to:

1. Identify 3 ocular conditions which can impact a child's vision or lead to permanent visual loss
2. List 3 special populations of children with diagnosed medical conditions that should bypass vision screening and go directly to eye exam.
3. Describe 5 components of a standardized visual acuity eye chart according to national and international eye chart design guidelines.



**Today's Objectives**

At the completion of this panel presentation you will be able to:

4. Describe 2 sets of appropriate optotypes for optotype-based screening and 3 devices for instrument-based screening.
5. Describe 2 components of a new web-based toolkit that supports a vision health system for children.
6. Describe 2 free resources that can help educate parents about their children's vision and eye health and improve follow-up to care.



**CREATING A SYSTEM FOR HEALTHY VISION**



**Traditional Approaches = Poor Outcomes**

- Duplication of services
- Little to no population level surveillance
- Increased medical expense
- Increased prevalence in high-risk populations
- Poor use of limited public health \$
- Barriers to health care are maintained
- Wide variation in VS approaches

All of this leads to maintained levels of vision disease prevalence in children.



**National Center for Children's Vision and Eye Health at Prevent Blindness**

The National Center for Children's Vision and Eye Health was established at Prevent Blindness with support from the Maternal and Child Health Bureau to create a public health infrastructure that will promote a comprehensive, multi-tiered continuum of vision care and eye health for young children.

- **Vision:**  
*Develop a full continuum of care for children by: Identifying vision conditions in children early, linking them to appropriate care, and ensuring they receive the care they need.*



**National Expert Panel and their Recommendations**

The recommendation manuscripts were published in the Journal of Optometric and Visual Sciences (OVS) as the lead articles in the January 2015 issue and available in OPEN ACCESS.

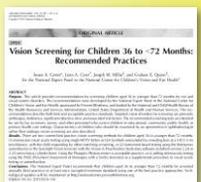
They are the first set of national recommendations for a uniform approach to preschool vision screening, data collection, and surveillance in clinical and public health settings ever published.

These recommendations along with a firm understanding of the available scientific evidence and expert experience provides state and national organizations with a solid foundation for building a comprehensive public health system for children's vision.



**Best Practices for Children's Vision (36 to <72 months)**

- Recommendations from national leaders in children's vision
- Peer-reviewed, published, open access
- VS practices, data collection, program accountability measures



<http://visionsystems.preventblindness.org>

**Closing the Student Vision Health Loop- Special Populations**

Sandra S. Block, OD, M Ed



## WHO DOES NOT NEED TO BE SCREENED OR WHAT CHILDREN SHOULD NOT BE SCREENED, BUT BE REFERRED DIRECTLY FOR AN EYE EXAM?



## SPECIAL POPULATIONS

- GROUPS WHO ARE KNOWN TO HAVE A HIGH PREVALENCE OF VISION PROBLEMS
- STUDENTS WHO ARE UNDER THE CARE OF AN EYE CARE PROVIDER
- CHILDREN WHO HAVE LOST OR BROKEN GLASSES
- CHILDREN WHO HAVE NEURODEVELOPMENTAL DIAGNOSES



## CHILDREN WHO HAVE NEURODEVELOPMENTAL DIAGNOSES

Children with the following syndromes or neurodevelopmental diagnoses are found to have many vision and eye health problems:

- Down syndrome
- Cerebral palsy
- Fetal alcohol syndrome
- Fragile X
- Intellectual and developmental disabilities



## TYPES OF VISION PROBLEMS SEEN

- Refractive Errors
  - Nearsighted, farsighted, astigmatism
- Amblyopia
- Strabismus
- Accommodative Deficits (focusing)
- Eye movement Deficits – fixation, following
- Eye Health – optic nerve atrophy, cataracts



## ESTABLISHED VISION AND EYE HEALTH PROBLEMS

Students who are under the care of an eye care provider

Children who have lost or broken glasses



## GROUPS WHO ARE KNOWN TO HAVE A HIGH PREVALENCE OF VISION PROBLEMS

- Children who are preterm or very low birth weight may be at risk for eye health problems, strabismus (eye turns), amblyopia (lazy eye), refractive errors, as well as other health issues.
- Children diagnosed with autism are at risk for similar eye health problems



## CHILDREN WITH ACADEMIC PROBLEMS?

- Whenever a parent is concerned about a child's vision or there are academic deficits that do not appear to match the child's ability – it is good to rule out a vision problem.



## WHAT HAPPENS ON SCREENING DAY?

- Children who are being referred are often brought along with the class for screening.
- While your time is valuable, there are times when including the child in the screening process is important:
  - Child is feeling left out.
  - Parent needs to understand that there is a reason to refer the child.



## WHAT SCREENING IS APPROPRIATE FOR CHILDREN WITH SPECIAL NEEDS

- It is recommended to use recognition visual acuity testing in cases where a valid and reliable response can be obtained.
- For some children, it is helpful for the classroom teacher to practice with the Lea Symbols prior to the day of the screening. The teacher knows the child, knows how to get them to respond, and can determine the type of response.
  - Verbal, matching, forced choice, or signing



### KNOW WHEN NOT TO CONDUCT SUBJECTIVE TESTS

- In cases where children do not have the cognitive ability to respond or are unable to react to a choice option, consider instrument based screening.
- Children with very short attention spans due to age, cognitive level, language barriers, attention span, or other inability to respond to va tests – do not attempt visual acuity testing – go directly to instrument based testing.



### SPECIAL EDUCATION CLASSES

- Communicate with the teacher to let her/him know what the vision screening entails.
- Instruct them to sensitize the classes to the pictures, the testing environment, covering one eye, and that you will be working with them.
- Use an area without excessive distractions, ensure good lighting, have an aid or someone in the area that knows the children.



- Work with one student at a time.
- Try not to rush the child with special needs.
- Encourage them to use alternative communication methods
- Speak directly to the child when trying to obtain a response.
- Reinforce positive behavior.



### SPECIAL NEED CHILDREN

- Expect them to take more time.
- Allow them to respond in their own way.
- Enjoy the experience.



### Optotype and Instrument-based vision screening

P. Kay Nottingham Chaplin, Ed D



### Optotype- and Instrument-Based Vision Screening

Learning Objectives:

3. Describe 5 components of a standardized visual acuity eye chart according to national and international eye chart design guidelines.
4. Describe 2 sets of appropriate optotypes for optotype-based screening and 3 devices for instrument-based screening.



### 2 Approaches to Vision Screening

1. **Optotype-based screening**
  - Tests of visual acuity using optotypes measure visual acuity
  - Clarity of vision when identifying an optotype at a prescribed distance
  - Provide info about presence or absence of refractive error and pathology within the visual pathway
2. **Instrument-based screening**
  - Instruments do not measure visual acuity
  - Instruments measure amblyogenic risk factors:
    - Significant refractive error
    - Anisometropia
    - Eye misalignment
    - Cataract



### Preferred Optotypes for Preschoolers

- National Expert Panel for the National Center for Children's Vision and Eye Health at Prevent Blindness
- American Academy of Ophthalmology/Pediatric Ophthalmology/Strabismus Panel
- American Association for Pediatric Ophthalmology and Strabismus
- Recommend LEA SYMBOLS® and HOTV letters as optotypes



Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 0 to <72 months: Recommended Practices. *Optometry and Vision Science*, 92(1), 6-16.

American Association for Pediatric Ophthalmology and Strabismus (2014). AAPOS techniques for pediatric vision screening. Available at: [http://www.aapos.org/client\\_data/files/2014/1/075\\_aapos\\_techniques\\_for\\_pediatric\\_vision\\_screening.pdf](http://www.aapos.org/client_data/files/2014/1/075_aapos_techniques_for_pediatric_vision_screening.pdf)

American Academy of Ophthalmology/Pediatric Ophthalmology/Strabismus Panel. (2012). Preferred Practice Pattern® Guidelines. Amblyopia. San Francisco, CA: American Academy of Ophthalmology. Available at: <http://www.aao.org/preferred-practice-pattern/pediatric-eye-evaluations-ppp--september-2012>

### Optotype Format

- Single, LEA SYMBOLS® or HOTV letter optotype surrounded with bars for children ages 3 to 6 years at 5 feet.



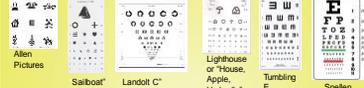
American Association for Pediatric Ophthalmology and Strabismus (2014). AAPOS techniques for pediatric vision screening. Available at: [http://www.aapos.org/client\\_data/files/2014/1/075\\_aapos\\_techniques\\_for\\_pediatric\\_vision\\_screening.pdf](http://www.aapos.org/client_data/files/2014/1/075_aapos_techniques_for_pediatric_vision_screening.pdf)

Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Science*, 92(1), 6-16.

• LEA SYMBOLS® or HOTV letter optotypes surrounded with crowding box for children ages 3 to 6 years **at 10 feet**.



Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Sciences*, 92(1), 6-16.

The National Expert Panel to the National Center for Children's Vision and Eye Health at Prevent Blindness states that the following charts are **UNACCEPTABLE** for screening vision of children ages 36 to <72 months (3 through 5 years):

- Allen figures
- Kindergarten "Sailboat" eye chart
- Landolt C
- Lighthouse
- Tumbling E
- Snellen

Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Sciences*, 92(1), 6-16.

Preferred Optotypes for School-Aged Children

- American Association for Pediatric Ophthalmology and Strabismus
  - **Recommends Sloan Letters**
- American Academy of Ophthalmology
  - **Recommends Sloan Letters and LEA Numbers**



American Association for Pediatric Ophthalmology and Strabismus (2014). AAPPOS techniques for pediatric vision screening. Available at: [http://www.aapos.org/client\\_data/files/2014/10/75\\_aapos\\_techniques\\_for\\_pediatric\\_vision\\_screening.pdf](http://www.aapos.org/client_data/files/2014/10/75_aapos_techniques_for_pediatric_vision_screening.pdf)

American Academy of Ophthalmology Pediatric Ophthalmology/Strabismus Panel. (2012). Preferred Practice Pattern® Guidelines: Amblyopia. San Francisco, CA: American Academy of Ophthalmology. Available at: <http://one.aao.org/preferred-practice-pattern/pediatric-eye-evaluations-ppp-september-2012>

National and International Distance Visual Acuity Eye Chart Recommendations

1980 - National Academy of Sciences-National Research Council (NAS-NRC)

- Committee on Vision. (1980). Recommended standard procedures for the clinical measurement and specification of visual acuity. Report of working group 36. Assembly of Behavioral and Social Sciences, National Research Council, National Academy of Sciences, Washington, DC. *Advances in Ophthalmology*, 4:1103-145.

1984 - International Council of Ophthalmology (ICO)

- [www.icooph.org/dynamic/attachments/resources/ico\\_visual\\_acuity1984.pdf](http://www.icooph.org/dynamic/attachments/resources/ico_visual_acuity1984.pdf)

2003 - World Health Organization Prevention of Blindness & Deafness (WHO)

- Prevention of blindness and deafness. Consultation on development of standards for characterization of vision loss and visual functioning. Geneva: WHO, 2003 (WHO/PBL/03.91).

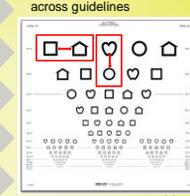
2010 - American National Standards Institute, Inc.

- ANSI Z80.21-1992 (R2004) Approved May 27, 2010



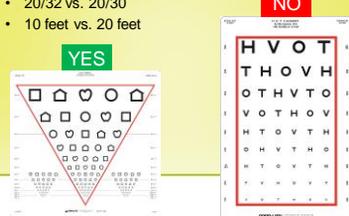
Similar recommendations across guidelines

- Optotypes approximately equal in legibility
- Horizontal between-optotype spacing = 1 optotype width
- Vertical between-line spacing = height of next line down
- Geometric progression of optotype sizes of 0.1 log units (logMAR, 5 lines)
- 5 optotypes per line
- Optotypes black on white background with luminance between 80 cd/m² and 160 cd/m²

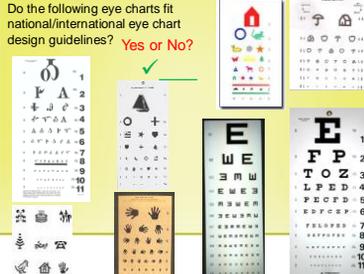



Tips:

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



Do the following eye charts fit national/international eye chart design guidelines? **Yes or No?**




Occlusion:

Children likely to peek when given responsibility for their own occlusion.



Occluders: Children 3 Through 5 years



American Association for Pediatric Ophthalmology and Strabismus (2014). AAPPOS techniques for pediatric vision screening. Available at: [http://www.aapos.org/client\\_data/files/2014/10/75\\_aapos\\_techniques\\_for\\_pediatric\\_vision\\_screening.pdf](http://www.aapos.org/client_data/files/2014/10/75_aapos_techniques_for_pediatric_vision_screening.pdf)

Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Sciences*, 92(1), 6-16.



### Unacceptable Occluders Ages 3 Through 5 Years

- Hand
  - Tissue
  - Paper or plastic cup
  - Cover paddle
- Why unacceptable?
  - Children can easily peek

Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Science*, 92(1), 6-16.



### Occluders –Older Children



### 2 Approaches to Vision Screening

1. Optotype-based screening
  - Tests of visual acuity using optotypes measure visual acuity
  - Clarity of vision when identifying an optotype at a prescribed distance
  - Provide info about presence or absence of refractive error and pathology within the visual pathway
2. Instrument-based screening
  - Instruments do not measure visual acuity
  - Instruments measure amblyogenic risk factors:
    - Significant refractive error
    - Anisometropia
    - Eye misalignment
    - Cataract



### Screening With Instruments

- Instruments
  - Require minimal child response or interaction.

Neely, D. E. (2013). The eyes have it: Advances in vision screening should lead to early diagnosis, treatment of preventable blindness in children. *AAP News*, 34(5), 14-15.



### Instrument-Based Screening – 3 to 6 Years



Note: When the Plusoptix and Spot devices are used outside of an eye care setting, consultation with a pediatric eye care professional regarding the best cut-offs to use for the particular patient population to be screened is advised until evidence-based refractive error criteria are determined.

<http://visionsystems.preventblindness.org/screening/instrument-based-vision-screening.html>

### Instrument-Based Screening

- Most vision experts believe instrument refractive error result cannot be converted to estimated visual acuity value.
- If use instruments, have test of visual acuity as backup.
  - If device has 90% "capture rate", how screen 10%?



### Referral Criteria

National Center for Children's Vision and Eye Health at Prevent Blindness

- Ages 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 (or 20/30) line
- American Association for Pediatric Ophthalmology and Strabismus
- Ages 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

Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Science*, 92(1), 6-16.

American Association for Pediatric Ophthalmology and Strabismus (2014). AAPOS techniques for pediatric vision screening. Available at: [http://www.aapos.org/ident\\_data/files/2014/1/015\\_aaopstechniquesforpediatricvisionscreening.pdf](http://www.aapos.org/ident_data/files/2014/1/015_aaopstechniquesforpediatricvisionscreening.pdf)



### Pointing from World Health Organization

- Pointing to each optotype to help children know where they are on the chart is permissible.
  - ☐ True or False?
  - ✓
- 1.8 "Line-by-line isolation or pointing may be used, **but not letter by letter.**"

- 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.



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 same day.
- If you have reason to believe that the child may perform better on another day, rescreen within 6 months.

Vision in Preschoolers Study Group. (2007). Children unable to perform screening tests in Vision in Preschoolers Study: Prevalence with ocular conditions and frequency of repeat screening. *Investigative Ophthalmology & Visual Science*, 48(1), 83-87.

American Academy of Ophthalmology/Pediatric Ophthalmology/Ophthalmology Panel. (2012). *Preferred Practice Patterns: Guidelines: Amblyopia*. San Francisco, CA: American Academy of Ophthalmology. Retrieved from <http://www.aao.org/eyebase/guidelines/guidelines/amblyopia>

Cohen, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended Practices. *Optometry and Vision Science*, 92(1), 6-16.

**Screening & History**

### A Historical Review of Distance Vision Screening Eye Charts

**What to Test, What to Keep, and What to Replace**

By Kay Nottingham Chaplin, Ed, MS  
Wendy Marsh-Tootle, OD, MS  
Geoffrey E. Bradford, MS, MD

Nottingham Chaplin, P. K., & Bradford, G. E. (2011). A historical review of distance vision screening eye charts: What to toss, what to keep, and what to replace. *NASN School Nurse*, 26(4), 221-228.

<http://nas.sagepub.com/content/26/4/221.abstract>

**Screening, History**

### Vision and Eye Health

**Moving Into the Digital Age With Instrument-Based Vision Screening**

By Kay Nottingham Chaplin, Ed  
Kay Baldonado, Ed  
Kay Hutchinson, RN  
Kara Moore, RN

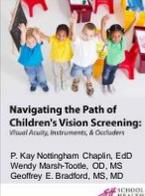
Nottingham Chaplin, P. K., Baldonado, K., Hutchinson, A., & Moore, B. (2015). Vision and eye health: Moving into the digital age with instrument-based vision screening. *NASN School Nurse*, 30(3), 154-60.

**Free eBook:**

*Navigating the Path of Children's Vision Screening*

- Screening practices
- Recommended tools
- Proper occlusion
- Guidance from national experts

Available at:  
<https://www.schoolhealth.com/media/pdf/NavigatingVisionScreening.pdf>



**Navigating the Path of Children's Vision Screening:**  
*Visual Acuity, Instruments, & Occluders*

P. Kay Nottingham Chaplin, EdD  
Wendy Marsh-Tootle, OD, MS  
Geoffrey E. Bradford, MS, MD



**Thank You for Your Time and Attention!**



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



**School Nurse Resources and Advocacy**

M. Kathleen Murphy, DNP, RN




**Role of the School Nurse**



- Understanding the systems that support vision health for children and families
- Advocating for systemic approaches to screening and follow-up
- Leveraging opportunities to identify children needing care
- Knowing the resources that support parents/caregivers in follow up
- Sharing information appropriately to ensure the best possible outcomes



**Vision System of Care**

The 12 components of a strong vision system of care

1. Appropriate educational materials for parents/caregivers
2. Parent/caregiver approval for information sharing
3. Screening with appropriate tools and procedures
4. Policies for children with special needs
5. Rescreening and difficult to screen children
6. Communicating screening results



**Vision System of Care**

The 12 components of a strong vision system of care

7. Systematic follow up with parents/caregivers to ensure eye exam
8. Linking parents/caregivers with eye care professionals
9. Ensuring receipt of eye exam results
10. Communicating results with primary care providers
11. Ensuring compliance with the eye care treatment plan
12. Ensuring vision program effectiveness through annual evaluation



## Supporting Families in Follow Up

Identifying the right resource to:

1. Help families communicate with providers
  - Fact Sheet on vision screening and development
  - Fact Sheet on eye health in diverse populations
  - Referral forms
2. Help families connect to care
  - Financial resources
  - Culturally and linguistically appropriate care



## Sharing Information for Better Outcomes

1. Share vision screening and follow-up data appropriately
  - Solicit information from teachers, social workers, coaches and other support staff regarding any child they may have a concern about.
  - Circle back to those referral sources to assist you in ensuring that appropriate follow-up occurs. They can be allies in encouraging families to pursue an eye exam.
  - Share the follow-up exam outcome—particularly if there are treatment implications for school/classroom activities.
2. HIPAA and FERPA
  - These are guidelines for sharing information—not barriers
3. Continuity of Care
  - Closing the loop between school-eye care-primary care

