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certification tool.

EHS/HS Evidence-Based Vision Screening

Dr. P. Kay Nottingham Chaplin, EdD

Introduction and Disclaimer



- 18 years in vision screening field
- *Former Director/Lead Trainer – Vision Initiative for Children – West Virginia University Eye Institute – focus on Head Start, school nurses, pediatric primary care practices*
- 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 Director – Vision and Eye Health Initiatives at Good-Lite and School Health Corporation
- *Current Education and Outreach Coordinator for the National Center for Children's Vision and Eye Health at Prevent Blindness*
- My focus is to encourage age-appropriate and evidence-based vision screening – based on national guidelines and best practices – as part of a 12-component Strong Vision Health System of Care.

- Dr. Nottingham Chaplin has (1) worked in the vision and eye health world since February 15, 2001; (2) provided 178 vision screening training workshops; and (3) lectured, trained, and consulted at more than 200 international, national, state, district, and local venues, including national webinars, and annual conferences for the:
 - National Association of School Nurses
 - National Head Start Association
 - School-Based Health Alliance
 - National Center on Early Childhood Health and Wellness

RELEVANT PUBLICATIONS and PAPERS:

1. Nottingham Chaplin, P. K., Baldonado, K., Cotter, S., Moore, B., & Bradford, G. E. (2018). An eye on vision: Seven questions about vision screening and eye health-Part 4. *NASN School Nurse*, 33(6), 351-354.
2. Nottingham Chaplin, P. K., Baldonado, K., Cotter, S., Moore, B., & Bradford, G. E. (2018). An eye on vision: Five questions about vision screening and eye health-Part 3. *NASN School Nurse*, 33(5), 279-283.
3. Nottingham Chaplin, P. K., Baldonado, K., Cotter, S., Moore, B., & Bradford, G. E. (2018). An eye on vision: Five questions about vision screening and eye health-Part 2. *NASN School Nurse*, 33(4), 210-213.
4. Nottingham Chaplin, P. K., Baldonado, K., Bradford, G. S., Cotter, S., & Moore, B. (2018). An eye on vision: Five questions about vision screening and eye health. *NASN School Nurse*, 33(3), 146-149.
5. Nottingham Chaplin, P. K., Baldonado, K., Bradford, G. S., Cotter, S., & Moore, B. (2018). An eye on vision: 20 questions about vision screening and eye health. *NASN School Nurse*, 33(2), 87-92.
6. 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.
7. 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.

Information You Will Take Home ...

3 Learning Objectives

List 18 vision development milestones that should occur in baby's first year of life.

Describe 1 evidence-based screening tool for ages 1 and 2 years

Describe 2 evidence-based screening tool for ages 3 and 4 years



Current State of Children's Vision in the U.S.

Up to 1 in 17 preschool-aged children in the United States has a vision problem that require treatment.

- If left untreated, these eye diseases and vision disorders can lead to **permanent** vision loss that cannot be corrected with prescription glasses, and/or
- Cause problems socially, academically, and developmentally.
- However . . . almost all (94%) of these vision problems can be found early with a vision screening . . . if children who do not pass vision screening:
 - See an eye doctor;
 - Receive treatment, if necessary; and
 - Follow the eye doctor's suggestions to improve vision.



What Does an "evidence-based Approach" Mean?

The National Center on Early Childhood Health and Wellness defines evidence-based as: "an umbrella term that refers to the use of the **best research evidence** (found in health sciences literature) and **clinical expertise** (what health care providers know).

[Adapted from the National Institutes of Health <https://prevention.nih.gov/resources-for-researchers/dissemination-and-implementation-resources/evidence-based-programs-practices>.]

For example:

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

Key Year 1 Vision Development Milestones



18 Vision Development Milestones From Birth to Baby's First Birthday

P. Kay Nottingham Chaplin, EdD – Kira Baldonado, BA

About this Tool:

- This document is a vision screening tool for Early Head Start, Parents as Teachers, and other early care and education programs.
- This tool is a table containing vision milestones in order of typical development.
- The 1st column lists the age.
- The 2nd column lists the milestones typically expected to occur for the age.
- The 3rd column lists the questions to ask.
- The 4th column lists Next Steps when a referral is required. It also provides activities that parents and caregivers can do to help with the milestones.
- Because each child develops differently and may meet the vision milestones at different ages, vision milestones may vary up to 6 weeks; some questions provide ages for rescreening before referring.
 - Although milestones may vary up to 6 weeks, if baby's eyes appear to be constantly misaligned (possible strabismus) at age 2 months or older, refer immediately for an eye examination.
- When using this tool with children who were born prematurely and have no health challenges, adjust chronological age to the corrected age* and use this tool based on corrected age (see above box). Visual development milestones may be delayed if babies have health challenges (i.e., genetic syndromes, neurologic and metabolic conditions, etc.). For these children, use vision screening results from the baby's primary care provider or eye examination results from the baby's eye care professionals to meet your vision screening mandate.

*To calculate "corrected age", subtract the number of weeks born before 40 weeks of gestation from the chronological age. For example, chronological age = 6 months (24 weeks). Child born at 28 weeks gestation. 40 weeks minus 28 weeks = 12 weeks. Chronological age of 24 weeks minus 12 weeks equal 12 weeks (3 months). Corrected age is 3 months. You may find this age calculator helpful: https://mymonthcycles.com/premature_baby_age_calculator.asp

Instructions:

- Visual skills typically develop in a particular order. To determine if the baby has met all vision milestones, begin with Page 2 regardless of baby's age. Do not skip to the chronological or corrected age of the baby you are screening.
- Check the appropriate boxes in the "Questions" column. Some will require rescreening if the vision milestone has not been met.
- Complete the "Questions" column of the table before completing the Pass/Rescreen/Refer Documentation pages beginning on page 10. This tool and/or the Pass/Rescreen/Refer Documentation can be placed the baby's file for record-keeping purposes.
- Use this tool throughout baby's first year to review vision development milestones.

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Page 1

Vision Developmental Milestones Check-off Tool available at:

<http://nationalcenter.preventblindness.org/publications-and-presentations>

Publications, Presentations and Videos

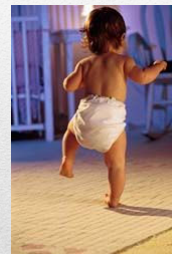
Presentations

- Parents as Teachers Conference - December 2017
- Annual Virginia School Nurses Association Conference - November 2017
- Northwest Indian Head Start Coalition Training Conference - August 2017
- Oklahoma Indian Head Start Directors Association Conference - August 1, 2017

Reports and Information from Prevent Blindness

- Results from 2016 National Survey of Children's Health (NSCH)
- 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
- 18 Vision Development Milestones From Birth to Baby's First Birthday
- 18 Vision Development Milestones From Birth to Baby's First Birthday (SPANISH)



- Time for reaching milestones can vary up to 6 weeks . . . **except milestone related to straight eyes.**
- Slides show when baby **should** reach milestones.
- Process:
 - Milestone(s) and age or age range when milestone(s) should occur
 - Questions to ask or behaviors to monitor about the milestones
 - What to do if milestones are not met . . . or next steps



- 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 reaching a milestone.





Child's Name: _____ DOB: _____ Age: _____

AGE (Milestones may vary up to 6 weeks.)	MILESTONE	QUESTIONS	NEXT STEPS
Birth through 1st month  <small>Image from BabyCenter: https://www.babycenter.co.uk/t1/048954/how-your-baby-learns-to-explore-photos</small>  <small>Image from Zero to Three: https://www.zerotothree.org/resources/164/play-activities-for-birth-to-12-months</small> <small>Picture 1 – Baby looks at object 8 to 15 inches away from face.</small> <small>Picture 2 – Passing a patterned object within 8 to 15 inches of baby's face.</small>	1. Baby begins to focus on lights, faces, and objects 8 to 15 (20.32 – 38.1 cm) inches away from his/her face. 2. Baby begins to follow slowly moving lights, faces, and objects at near. NEXT MILESTONE DURING AGE 2ND AND 3RD MONTHS	1. Does baby focus on lights, faces, and objects 8 to 15 inches (20.32 – 38.1 cm) in front of his/her face? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps. 2. Is baby beginning to follow slowly moving lights, faces, and objects with his/her head and eyes? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps.	<input type="checkbox"/> Refer to baby's primary health care provider for further evaluation and to coordinate a referral for an eye examination. <input type="checkbox"/> Refer to Birth to 3 Early Intervention program. <input type="checkbox"/> Activities parents and caregivers can do: <ul style="list-style-type: none"> • Hold your baby in front of you, look at your baby, and slowly move your head from side to side. Play together and have fun! • Hold a patterned, high-contrast toy within 8 to 15 inches (20.32 – 38.1 cm) of your baby's face. Slowly move the object up and down or side to side. Play together and have fun! • Place a small rattle or colorful, plastic ring in your baby's hands and gently shake your baby's hands in front of your baby's face. Play together and have fun!

Home-Based Visitor/Nurse Signature: _____ Date: _____

Page 2



Child's Name: _____ DOB: _____ Age: _____

AGE (Milestones may vary up to 6 weeks.)	MILESTONE	QUESTIONS	NEXT STEPS
During 2nd and 3rd months  <small>Image from CDC: https://www.cdc.gov/ncbddd/early/milestones/photoalbum/2-months.html</small> <small>Picture 5 – Lively visual communication with social smile.</small>  <small>Image from Lea Hyvärinen, MD, PhD: http://www.lea-test.fi/index.html?start=en/asses-sme/lowvisio/index.html</small> <small>Picture 6 – Baby turns head away from the parent.</small>	3. Baby begins to notice his/her hands. 4. Baby makes eye contact with parent or caregiver. 5. Baby follows moving lights, faces, people, and objects with both eyes together. 6. Baby has a social smile. IF BABY IS AGE 3 TO 4 MONTHS, ALSO DO THE FOLLOWING MILESTONE	3. Is baby aware of his/her hands during the 2 nd month? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> No (refer and move to Next Steps). 4. Does baby look directly at parent's or caregiver's eyes? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps. 5. Is baby following moving lights, faces, people, and objects with both eyes together? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps. 6. Is baby smiling at his/her parent or caregiver by age 3 months? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> No (Refer and move to Next Steps).	<input type="checkbox"/> Refer to baby's pediatric primary health care provider for further evaluation and to coordinate a referral for an eye examination. <input type="checkbox"/> Refer to Birth to 3 Early Intervention program. <input type="checkbox"/> Activities parents and caregivers can do: <ul style="list-style-type: none"> Look at your baby with his/her face about 8 to 15 inches from your face, wait for your baby to look at your face; and smile, sing, or talk to your baby. Play together and have fun! Hold a favorite toy, bottle, or patterned and high-contrast object within 8 to 15 inches (20.32 – 38.1 cm) of your baby's face. Slowly move the object up and down or side to side. Play together and have fun!

Home-Based Visitor/Nurse Signature: _____ Date: _____

Page 3

Child's Name: _____ DOB: _____ Age: _____

AGE (Milestones may vary up to 6 weeks.)	MILESTONE	QUESTIONS	NEXT STEPS
During 3rd and 4th months  <small>http://www.howwemontessori.com/m/how-we-montessori/2011/07/grasping-and-in-hand-materials.html</small> <small>Picture 7 – Baby becomes aware of hands.</small>  <small>http://www.flynnleitch.com/2017/02/</small> <small>Picture 8 – Baby explores hands with mouth.</small>	7. Baby watches his/her hand movements. 8. Baby reaches for objects or parent's or caregiver's face. 9. Baby grasps and holds objects in his/her hands. 10. Baby brings objects to his/her mouth. 11. Baby moves eyes from person to person or object to object. NEXT MILESTONE AT AGE 5 MONTHS	7. Does baby watch his/her hands? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps. 8. Does baby reach for objects or parent's or caregiver's face? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps. 9. Does baby grasp and hold an object in his/her hands? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> Not Yet (rescreen within 6 weeks). Date for rescreen: _____ <input type="checkbox"/> If "No" after rescreening, move to Next Steps. 10. Does baby bring objects to his/her mouth by age 4 months? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> No (refer and move to Next Steps). 11. Does baby shift his/her eyes from person to person or object to object during age 4 months? <input type="checkbox"/> Yes (pass). <input type="checkbox"/> No (refer and move to Next Steps).	<input type="checkbox"/> Refer to baby's pediatric primary health care provider for further evaluation and to coordinate a referral for an eye examination. <input type="checkbox"/> Refer to Birth to Three Early Intervention program. <input type="checkbox"/> Activities parents and caregivers can do: <ul style="list-style-type: none"> With baby's back on a flat surface, gently use baby's elbows to bring hands together at the middle of baby's chest. Play together and have fun! Use age-appropriate baby toys to help baby use his/her hands to explore. Play together and have fun! Hold a toy in one hand toward the right side of baby's face and shake or activate the toy. Repeat with a different toy in the other hand toward the left side of baby face. Alternate between toys, shaking or activating one toy at a time.

Home-Based Visitor/Nurse Signature: _____ Date: _____

Page 4

Child's Name: _____ DOB: _____ Age: _____			
Pass/Rescreen/Refer Documentation			
Birth through 1st Month			
1. Does baby focus on lights, faces, and objects 8 to 15 inches (20.32 – 38.1 cm) in front of his/her face?	Screen Date:	Rescreen Date:	
	<input type="checkbox"/> Pass <input type="checkbox"/> Rescreen	<input type="checkbox"/> Pass <input type="checkbox"/> Refer health care provider <input type="checkbox"/> Refer EI	
2. Is baby beginning to follow slowly moving lights, faces, and objects with his/her head and eyes?	Screen Date:	Rescreen Date:	
	<input type="checkbox"/> Pass <input type="checkbox"/> Rescreen	<input type="checkbox"/> Pass <input type="checkbox"/> Refer health care provider <input type="checkbox"/> Refer EI	
During 2nd and 3rd Months			
3. Is baby aware of his/her hands during the 2 nd month?	Screen Date:		
	<input type="checkbox"/> Pass <input type="checkbox"/> Refer health care provider <input type="checkbox"/> Refer EI		
4. Does baby look directly at parent's or caregiver's eyes?	Screen Date:	Rescreen Date:	
	<input type="checkbox"/> Pass <input type="checkbox"/> Rescreen	<input type="checkbox"/> Pass <input type="checkbox"/> Refer health care provider <input type="checkbox"/> Refer EI	
5. Is baby following moving lights, faces, people, and objects with both eyes together?	Screen Date:	Rescreen Date:	
	<input type="checkbox"/> Pass <input type="checkbox"/> Rescreen	<input type="checkbox"/> Pass <input type="checkbox"/> Refer health care provider <input type="checkbox"/> Refer EI	
6. Is baby smiling at his/her parent or caregiver by age 3 months?	Screen Date:		
	<input type="checkbox"/> Pass <input type="checkbox"/> Refer health care provider <input type="checkbox"/> Refer EI		
Home-Based Visitor/Nurse Signature: _____ Date: _____			

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<p>Expert Contributors:</p> <p>Sandra Block, OD, Med, MPH, FAAO, FCOVD</p> <ul style="list-style-type: none"> Member of National Expert Panel to the National Center for Children's Vision and Eye Health (NCCVEH) at Prevent Blindness Professor, Medical Director, School Based Clinics, Director of School-Based Research at Illinois College of Optometry <p>Deborah Chen, PhD</p> <ul style="list-style-type: none"> Professor Emerita in Early Childhood Special Education, Department of Special Education, California State University Northridge Co-author with Gail Calvillo and Clare Taylor Friedman of the Parents and Infants with Visual Impairments (PAIVI) Manual, created as a 3-year project of the Blind Babies Foundation with support from the U.S. Department of Education <p>Megan E. Collins, MD, Pediatric Ophthalmologist</p> <ul style="list-style-type: none"> Assistant Professor of Ophthalmology, Wilmer Eye Institute, Johns Hopkins Medicine A Principle Investigator of BREDs, Vision for Baltimore, and Vision for Chicago <p>Susan Cotter, OD, MS, FAAO</p> <ul style="list-style-type: none"> Member of National Expert Panel to the National Center for Children's Vision and Eye Health (NCCVEH) at Prevent Blindness Member of Advisory Committee to the NCCVEH Professor at the Southern California College of Optometry at Marshall B. Ketchum University <p>Anne S. Nielsen, PhD</p> <ul style="list-style-type: none"> Outreach Coordinator, Kansas State School for the Blind Manhattan Kansas Office

Resources Consulted:

Chen, D., Calvillo, G., & Taylor, C. (2015). *Parents and his/her infants with visual impairments (PAIVI)* (2nd ed.). Louisville, KY: American Printing House for the Blind, Inc.

Donahue, S. P., Baker, C. N., AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

Hyvärinen, L., Walther, R., Jacob, N., Lawrence, L., & Nottingham Chaplin, P. K. (2016). Delayed visual development: Development of vision and visual delays. American Academy of Ophthalmology, Pediatric Ophthalmology Education Center. Retrieved from <https://www.aao.org/pediatric-center-detail/delayed-visual-development-development-of-vision-y>

Trubo, R. (2014). *The complete and authoritative guide. Caring for your baby and young child: Birth to age 5*. S. P. Shelov, T. R. Altmann & R. E. Hannemann (Eds.). (6th ed.). New York, NY: Bantam Books

Vision Screening Years 1 and 2



Cast of Characters

NCCVEH:

- National Center for Children's Vision and Eye Health at Prevent Blindness
 - Optometry
 - Ophthalmology
 - Family Advocates
 - Nurses
 - Public Health Professionals
 - Educators

AAP:

- American Academy of Pediatrics
- American Association for Pediatric Ophthalmology and Strabismus
- American Academy of Ophthalmology
- American Association of Certified Orthoptists

Years 1 and 2 - Vision Screening Tools

Instrument-based screening

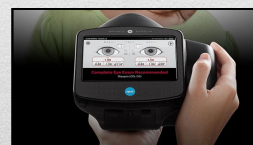
- Instruments assess the eye **STRUCTURE**, not how the brain interprets **CLEARNESS** of vision
- Instruments analyze digital images of the eyes to provide information about amblyopia risk factors:
 - Estimates of significant refractive error (hyperopia [farsightedness], myopia [nearsightedness], astigmatism [blurred vision at both near and far])
 - Estimates of anisometropia (significant difference of refractive error between the two eyes)
 - Estimates of eye misalignment



Instrument-Based Screening

AAP

- Use beginning at age 12 months
- Ages 1 and 2 years



Donahue, S. P., Baker, C. N., AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

Instruments Vetted by NCCVEH



Welch Allyn®
Spot™ Vision Screener



Welch Allyn®
SureSight™
Vision Screener



Retinomax
(Right Mfg. Co Ltd.-
Tokyo, Japan)



Plusoptix
S12C Vision Screener

2 Approaches to Vision Screening

1. Optotype-based screening

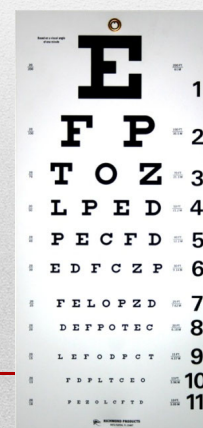
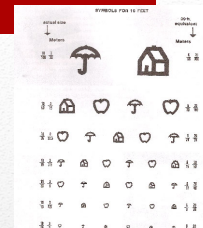
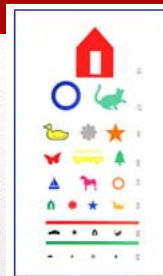
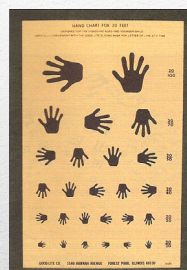
- Tests of visual acuity using optotypes to measure visual acuity as interpreted by the brain
 - Quantifiable measurement of the sharpness or clearness of vision when identifying specific optotype sizes at a standardized distance

2. Instrument-based screening


- Instruments do not measure visual acuity
- Instruments use an automated image acquisition and analysis system 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)




"Not so great" charts . . .



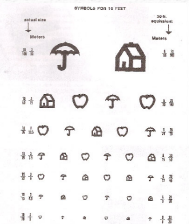
NOT Recommended by NCCVEH and/or AAP



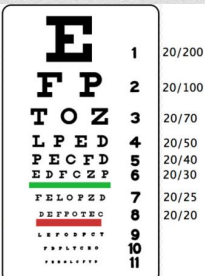
"Sailboat"



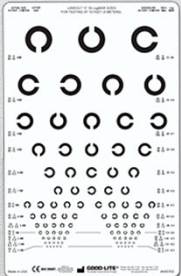
Allen Pictures




Lighthouse or
"House, Apple,
Umbrella"



Snellen









Landolt C



Tumbling E

More Charts NOT Recommended by NCCVEH

Broken Wheel Test	
Optotypes in Color	
Patti Pics Visual Acuity Chart	
Kay Pictures®	
Michigan Preschool Test	
Titmus Vision Screening Machine	

https://nationalcenter.preventblindness.org/sites/default/files/national/documents/Characteristics_of_Visual_Acuity_Charts_for_Screening_Children_Revised_9.27.17.pdf

<https://nationalcenter.preventblindness.org/programs-and-resources>

Why **NOT** Recommended?

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

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. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/opx-92-06.pdf>

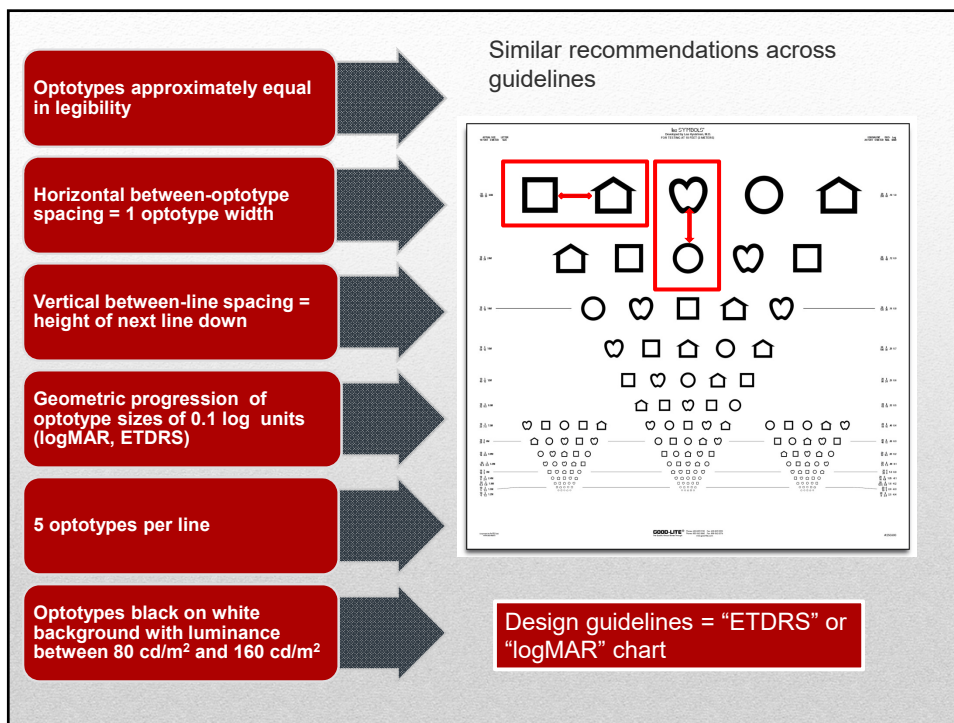
Donahue, S. P., Baker, C. N., & AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

Importance of Appropriate Tools

- “Visual acuity scores can be significantly affected by the chart design.” (p. 1248)
 - Bailey, I.L. (2012). Perspective: Visual acuity – Keeping it clear. *Optometry and Vision Science*, 89(9), 1247-1248.
- Excluding optotype size, “each visual acuity level on a test chart should present an essentially equivalent task”. (p. 740)
 - Bailey, I. L., & Lovie, J. E. (1976). New design principles for visual acuity letter charts. *American Journal of Optometry & Physiological Optics*, 53(11), 740-745.

National and international distance visual acuity eye chart design recommendations

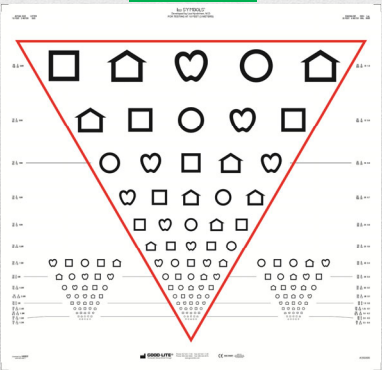
- **1980 - National Academy of Sciences-National Research Council (NAS-NRC)**
 - Committee on Vision. (1980). Recommended standard procedures for the clinical measurement and specification of visual acuity. Report of working group 39. Assembly of Behavioral and Social Sciences, National Research Council, National Academy of Sciences, Washington, DC. *Advances in Ophthalmology*, 41:103–148.
- **1984 - International Council of Ophthalmology (ICO)**
 - www.icoph.org/dynamic/attachments/resources/icovisualacuity1984.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



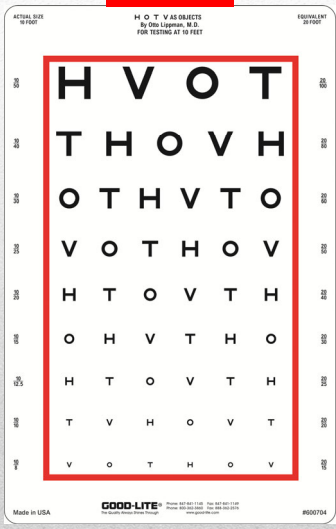
Tips:

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

YES





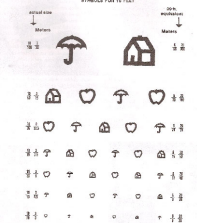
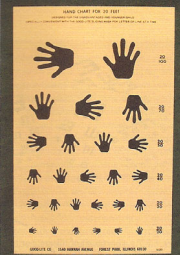



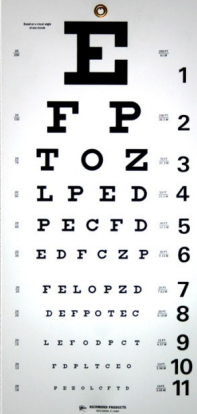
NO



Do the following eye charts fit national/international eye chart design guidelines?

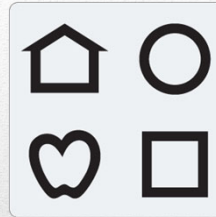
Yes or No?

✓ NO

Preferred Optotypes for Ages 3 to 6 Years

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

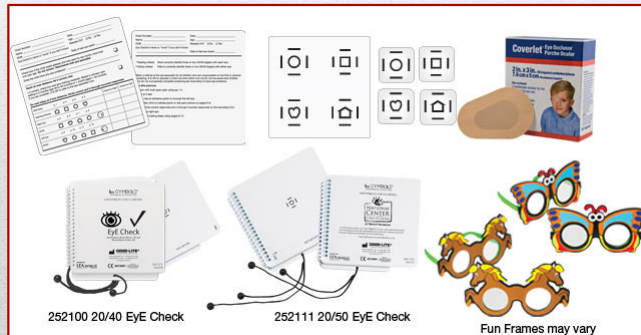


Cotter, S. A., Cyert, L. A., Miller, J. M., & Quinn, G. E. for the National Expert Panel to the National Center for Children's Vision and Eye Health. (2015). Vision screening for children 36 to <72 months: Recommended practices. *Optometry and Vision Science*, 92(1), 6-16. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/oxp-92-06.pdf>

Donahue, S. P., Baker, C. N., & AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

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



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. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/oxp-92-06.pdf>

How do you use the response panel and 4 individual cards?

- Card with 4 optotypes – use as matching game
- Individual cards may be placed on floor in front of child – ask child to step on card matching optotype to identify

Options: Critical Line Screening at 10 feet

Sight Line Kit



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. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/opx-92-06.pdf>

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Also
acceptable . . .



<https://www.schoolhealth.com/eyespy-20-20-vision-screener>
Using HOTV letters – NOT Landolt C

Screening Distance

- 10 feet from chart to child's eyes
- *New, standardized distance charts will be at 10 feet for children and adults*
- 10/xx on left side of chart with 20/xx on right side – report 20/xx



Unacceptable Occluders Ages 3, 4, and 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. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/opx-92-06.pdf>

Occluders – Younger Children <10 Years



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?

✓ False

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

World Health Organization (2003). *Consultation on development of standards for characterization of vision loss and visual functioning*. Geneva: Switzerland. Retrieved from http://apps.who.int/iris/bitstream/10665/68601/1/WHO_PBL_03.91.pdf



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.

Vision in Preschoolers Study Group. (2007). Children unable to perform screening tests in Vision in Preschoolers Study: Proportion with ocular conditions and impact on measure of test accuracy. *Investigative Ophthalmology & Visual Science*, 48(1), 83-87.

American Academy of Ophthalmology Pediatric Ophthalmology/Strabismus Panel. (2012). Preferred Practice Pattern® Guidelines. Amblyopia. San Francisco, CA: American Academy of Ophthalmology. Retrieved from <https://www.aao.org/preferred-practice-pattern/amblyopia-ppp-september-2012>

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. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/oxp-92-06.pdf>

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*

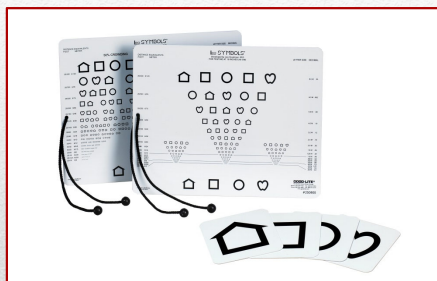
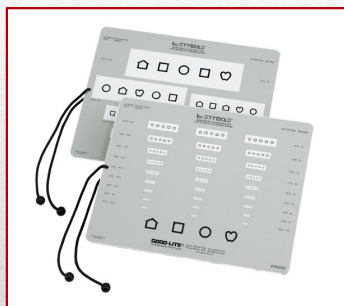
AAP

- 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)*

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. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274336/pdf/oxp-92-06.pdf>

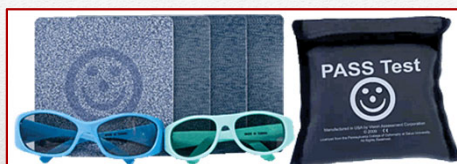
Donahue, S. P., Baker, C. N., AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

Choices for Near Vision Screening



Can do critical line only with both eyes open or one eye at a time.

Stereoacuity Screening if NOT using Spot



PASS 2 Smile Test

If Doing Color Vision Deficiency Screening . . .



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 clearness of vision when identifying specific optotype sizes at a standardized distance*
2. Instrument-based screening
 - Instruments do not measure visual acuity
 - *Instruments use an automated image acquisition and analysis system 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 (AAP)
- Use instruments OR tests of visual acuity for children ages 3, 4, and 5 years (NCCVEH and AAP)



Donahue, S. P., Baker, C. N., & AAP Committee on Practice and Ambulatory Medicine, AAP Section on Ophthalmology, American Association of Certified Orthoptists, American Association for Pediatric Ophthalmology and Strabismus, American Academy of Ophthalmology (2016). Procedures for the evaluation of the visual system by pediatricians. *Pediatrics*, 137(1), e20153597. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/early/2015/12/07/peds.2015-3597.full.pdf>

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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 Vetted by NCCVEH



Welch Allyn®
Spot™ Vision Screener



Welch Allyn®
SureSight™
Vision Screener



Retinomax
(Right Mfg. Co Ltd.-
Tokyo, Japan)



Plusoptix
S12C Vision Screener

- Instruments typically will not capture readings on 100% of children (e.g., 97%).
- If doing instrument-based screening, still want optotype-based screening tool . . . just in case for other 3%.
- Example . . .



Welch Allyn®
Spot™ Vision Screener

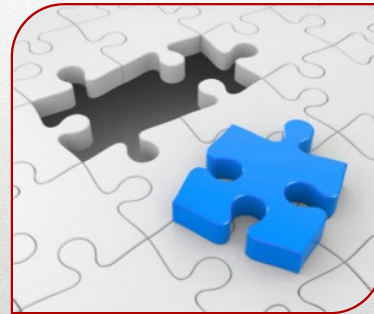


Sight Line Kit



Vision Screening is . . .

- Part of a process...not a single event.
- 1 of 12 components of a strong vision health system of care.



Evaluating Your Vision Health Program

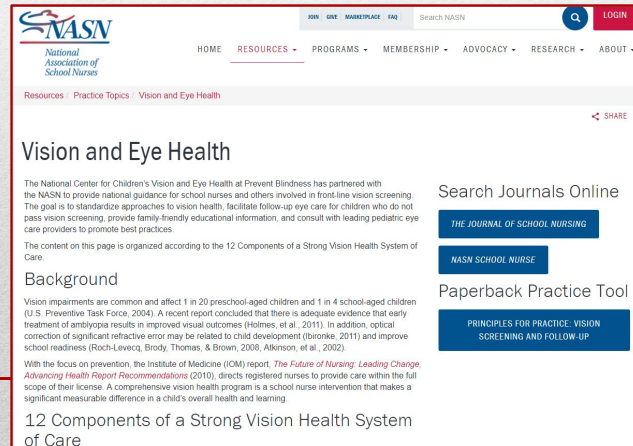
Annual Vision Health Program Evaluation Checklist		12-Components of a Strong Vision Health System of Care
Evaluation Date: _____ Completed By: _____ Instructions: Review each component described below. Select the "Yes", "No", or other response that best describes your vision health program as it currently operates. Please note comments in the area indicated. Once you have responded to the questions in each of the components proceed to the "Vision Health System Action Plan" located on page 7 to identify areas for attention or improvement in your program.		
1. Our program ensures that all parents/caregivers receive educational material, which respects cultural and literacy needs, about the importance of: a. Good vision for their child now and in the future. b. Scheduling and attending an eye exam when their child does not pass vision screening. c. Increased risk for vision problems in defined high-risk populations.		
Check Yes or No	Point of evaluation	Our Children's Vision Health System Action Plan
<input type="checkbox"/> Yes <input type="checkbox"/> No	We have vision health information in all native languages of the families that we serve.	Directions: Review your responses from the program evaluation form and the notes written for each item. In all areas where "no" was the response selected, or your notes indicate a need for improvement, establish the next steps your program will take to improve efforts in that area. Once all responses have been accounted for, establish your top three priorities out of your needed actions, a date to review progress, and a completion date.
<input type="checkbox"/> Yes <input type="checkbox"/> No	We discuss the importance of healthy vision as a part of proper child development in the general health information provided by our program.	
<input type="checkbox"/> Yes <input type="checkbox"/> No	We provide parents with easy-to-understand* information on the visual milestones for children at all stages of life. <small>*Information is written at an appropriate reading level, provides graphics as well as descriptions, and has been tested for ease of understanding.</small>	
<input type="checkbox"/> Yes <input type="checkbox"/> No	Our parent/and or health advisory committee(s) have reviewed our vision health information for, content, clarity of instruction, cultural literacy, and reading level (4 th to 6 th grade level.)	
<input type="checkbox"/> Yes <input type="checkbox"/> No	We provide health information to parents of children with special healthcare needs that describe their increased risk for vision problems.	
<input type="checkbox"/> Yes <input type="checkbox"/> No	We have active Parent and Health Advisory Committees	Needed actions: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ Priority #1: _____ Priority #2: _____ Priority #3: _____

<https://www.nasn.org/nasn-resources/practice-topics/vision-health>

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>



Vision Developmental Milestones Check-off Tool available at:

<http://nationalcenter.preventblindness.org/publications-and-presentations>

Publications, Presentations and Videos

Presentations

- Parents as Teachers Conference - December 2017
- Annual Virginia School Nurses Association Conference - November 2017
- Northwest Indian Head Start Coalition Training Conference - August 2017
- Oklahoma Indian Head Start Directors Association Conference - August 1, 2017

Reports and Information from Prevent Blindness

- Results from 2016 National Survey of Children's Health (NSCH)
- 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
- 18 Vision Development Milestones From Birth to Baby's First Birthday
- 18 Vision Development Milestones From Birth to Baby's First Birthday (SPANISH)

NATIONAL CENTER
for Children's Vision & Eye Health
AT PREVENT BLINDNESS

Provider education tools

Parent/family resources

Technical assistance

Professional Development

Communication tools

National Center for Children's Vision & Eye Health

The Center is designed to support the development of public health infrastructure to prevent and address a comprehensive range of vision problems in children and to help bring best practices, research, training, and targeted policy initiatives. The work through the Center is designed to support the development of public health infrastructure to prevent and address a comprehensive range of vision problems in children and to help bring best practices, research, training, and targeted policy initiatives.

Vision Systems

Prevent Blindness Vision Systems are designed to help public health professionals and community-based organizations to identify and address vision problems in children and to help bring best practices, research, training, and targeted policy initiatives.

<http://nationalcenter.preventblindness.org>

THINK OF VISION

Guide for Preschool Teachers

A young child does not know how they should see and cannot tell us about their vision. One or two children in every preschool classroom will have a vision disorder that, left unidentified and untreated, could interfere with their development and acquisition of early literacy skills. As a preschool teacher, you can support the vision of the children you teach.

If you repeatedly observe a preschooler exhibiting one or several of these signs, **THINK OF VISION**. Ask the parent, school nurse, or health manager for the child to receive a vision screening or comprehensive eye exam from an eye doctor:

APPEARANCE:

- Eyes are crusty, red, watery, inflamed or don't line up
- Eye turn, wandering eye, droopy eyelid

BEHAVIORS:

- Squints, frowns, rubs eyes or blinks frequently
- Body rigid, or thrusts head forward or backward when looking at distant objects
- Avoidance of eye contact
- Extreme shyness, poor social interaction
- Easily distractible/unable to focus or maintain attention
- Avoids playing outside or joining in games
- Difficulty coordinating hand/eye movements (e.g., picking up objects)
- Climsy, bumps into things

WHEN READING, WRITING OR DOING CLOSE-UP WORK:

- Poor letter or word recognition
- Difficulty completing a letter or symbol
- Rereads, skips lines, or loses place often
- Closes one eye when doing near work
- Tilts or turns head, or lays head on desk
- Falls asleep while reading
- Loses interest quickly
- Seems cranky when doing near tasks
- Holds books or objects close to face


ENROLLMENT IN PROGRAMS:

A comprehensive eye exam from an eye doctor should be part of the evaluation process if a child:

- Is enrolled in Early Intervention
- Is enrolled in a Special Education program
- Will receive an I.E.P. in school
- Has developmental delays

Most childhood vision disorders are treated by wearing prescription eyeglasses. To allow a preschooler the opportunity to enjoy play and learning, gain skills, and reach their fullest potential, the child needs to follow the eye doctor's treatment plan.

Teachers can help by understanding how the child's prescribed treatment should be applied in the classroom, and reinforcing and encouraging children and parents with adherence.



Visit childrensvisionmassachusetts.org for more information.

<https://childrensvision.preventblindness.org/sites/default/files/THINK%20OF%20VISION%2011-8-18.pdf>

VISION SCREENING FACT SHEET



NATIONAL CENTER ON
Early Childhood Health & Safety

Pruebas de la vista: Ficha técnica de los programas de educación y cuidado tempranos

Updated Spanish
Fact Sheet
coming soon



Parents' and early care and education staff cannot always tell when a child has trouble seeing. Observation alone isn't enough. This is why implementing evidence-based vision screening throughout early childhood is important.

Introduction

Children use all their senses to learn. Children's play with puzzles, crayons, balls, and blocks can improve important visual skills. These skills contribute to a child's school readiness. An uncorrected vision problem can be a barrier to this readiness.

Timely vision screening (coupled with an eye examination when indicated) is an important step toward early detection of any possible vision problems. Early detection can lead to an effective intervention and help to restore proper vision. Young children rarely complain when they can't see well because they, not normal.

Health managers may begin by looking at most recent physical for the date and res

Evidence-based Vision Screening

Evidence-based is an umbrella term that use of the best research evidence (found sciences literature) and clinical expertise health care providers know).

Adapted from the National Institutes of Health: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4130242/>

An evidence-based vision screening is a 1) identify children who need an evaluation vision and eye health. Head Start and Early Start programs are required to obtain or evidence-based vision screening.

45 CFR §1302.42 Child health status and 3) Ensuring up-to-date child health status

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

(3) If a program operates for 90 days or days from the date the child first attends to satisfy paragraphs (b)(1) and (2) of the <https://eclkc.ohs.acf.hhs.gov/policy/45-cfr-1302-42-child-health-status-care>

Health managers may begin by looking at most recent physical for the date and res

Introducción

Los niños usan todos sus sentidos para aprender. Jugar con rompecabezas, crayones, pelotas y bloques puede mejorar las habilidades visuales importantes. Estas habilidades contribuyen con la preparación escolar de los niños. Un problema de la vista sin corregir puede ser una barrera para esta preparación.

Las pruebas de la vista realizadas de manera oportuna (junto con un examen ocular cuando se indica) son un paso importante hacia la detección temprana de cualquier problema de la vista posible. La detección temprana también puede contribuir a una intervención eficaz y a restaurar una visión adecuada. Los programas Head Start y Early Head Start, en colaboración con los padres de familia, deben cumplir con el requisito de realizar pruebas de la vista a los niños en un plazo de 45 días naturales desde la entrada del niño al programa, o de obtener los resultados de las pruebas de la vista en ese plazo (30 días para programas de menor duración).

Los administradores de salud pueden comenzar por observar el examen físico más reciente y los resultados de una prueba de la vista del niño. Muchos programas también deciden realizar sus propias pruebas de la vista. Algunas maneras pueden ser las siguientes:

- El niño fue poco cooperativo para la realización de una prueba anterior.
- Los resultados de la prueba de la vista del niño no se encuentran disponibles.
- Un familiar o un miembro del personal informan una inquietud respecto de la vista del niño.
- El Comité Asesor de los Servicios de Salud

Los programas pueden realizar pruebas de la vista en cualquier momento, como antes o durante las primeras semanas de un nuevo año del programa cuando muchos niños ingresan al mismo tiempo. El personal o los voluntarios capacitados pueden realizar pruebas de la vista. Los programas pueden comunicarse con [Prevent Blindness](http://preventblindness.org) que tiene un programa de capacitación y certificación sobre pruebas de la vista. Prevent Blindness y sus filiales ponen a disposición esta capacitación. Otros grupos comunitarios capacitados también pueden realizar pruebas de la vista empíricas según la edad. Algunos programas han trabajado con grupos comunitarios voluntarios como los siguientes:

- Alumnos de la escuela
- Organizaciones estatales o comunitarias
- Escuelas de medicina o programas de capacitación oftalmológica

Los programas que pueden tener una función de apoyo en la vida de sus niños, como los servicios de salud mental, los servicios de salud dental y los servicios de salud mental.

La preparación para la escuela empieza con la salud.

© 2017 Head Start. 000-227-5125. Centro distribuido: health@eclkc.org PÁGINA 1 DE 6

Download at:

<https://eclkc.ohs.acf.hhs.gov/physical-health/article/vision-screening>

36 CHILDREN'S VISION
EXCHANGE MAY/JUNE 2014

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Children's Vision Health

How to Create a Strong Vision Health System of Care

by P. Kay Nottingham Chaplin, Jean E. Ramsey, and Kira Baldonado

The authors thank the members of the Advisory Committee for the National Center for Children's Vision and Eye Health at Prevent Blindness for their support in the development of this article.

Research suggests that up to 1 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 (Calonge, 2004). Head Start, Early Head Start, and early childhood program vision screeners are in a perfect position to help find these children, who can then be referred to an eye care provider for diagnosis and treatment.

the brain receives clear, focused images from each eye. Any conditions that interfere with this development can cause vision loss known as amblyopia or "lazy eye." Four common conditions that can lead to amblyopia include:

1. *Misaligned eyes* (i.e., strabismus): Eyes crossing consistently after age 4 to 6 months (American Academy of Ophthalmology, 2012).

To assist front-line screeners, the

Madison, a child enrolled in Head Start, did not pass a vision screening and received glasses after a follow-up eye exam. When she returned to her classroom with her new glasses, Madison walked into the room and looked around. A picture of a giraffe on the wall caught her attention. She walked to the picture, looked at the giraffe, turned to her teacher, and said, "I didn't know giraffes had eyes!"

<https://georgia.preventblindness.org/sites/default/files/georgia/documents/Exchange%20Magazine%20article.pdf>

Year of Children's Vision

- <http://nationalcenter.preventblindness.org/year-childrens-vision>
- *Archived vision screening webinars in Resources*



Resources to Support Families . . .

Financial Assistance Information

Association of Schools and Colleges of Optometry
1110 Executive Boulevard, Suite 510
Rockville, Maryland 20852
Phone: (301) 251-5544
Fax: (301) 755-1629
www.asco.org

Many optometry schools offer financial aid to people willing to be trained by underserved communities. They may also provide free care to people who are research subjects.

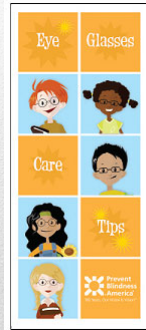
Chronic Disease Fund
1000 N. Dakota Parkway, Suite 200
Palo Alto, CA 94304
Tel: (650) 859-1000
Fax: (650) 859-1000
www.cdfund.org

Chronic Disease Fund® is an independent 501(c)(3) non-profit charitable organization helping patients with chronic disease, can care or the chronic condition obtain the expensive medications they need.

Prevent Blindness
Our Vision Is Vision®

211 West Wacker Drive
Suite 1700
Chicago, Illinois 60606
800.331.2020
PreventBlindness.org

Financial Assistance Programs



Tips for Wearing Eye Glasses
<https://www.preventblindness.org/your-childs-glasses>

Parent Education

你知道吗?
儿童视力问题通常没有明显症状，但如果不及时发现和治疗，可能会导致永久性失明。许多儿童视力问题可以通过早期发现和及时治疗得到纠正。如果您怀疑您的孩子可能有视力问题，请咨询眼科医生。

眼科疾病的症状
1. 经常流眼泪、眼痒、眼痛或眼红。
2. 经常揉眼睛。
3. 经常眯眼睛。
4. 经常眨眼。
5. 经常说眼睛不舒服。
6. 经常说眼睛有东西。
7. 经常说眼睛看不清。
8. 经常说眼睛有阴影。
9. 经常说眼睛有光。
10. 经常说眼睛有颜色。
11. 经常说眼睛有形状。
12. 经常说眼睛有大小。
13. 经常说眼睛有位置。
14. 经常说眼睛有方向。
15. 经常说眼睛有运动。
16. 经常说眼睛有感觉。
17. 经常说眼睛有思想。
18. 经常说眼睛有灵魂。
19. 经常说眼睛有生命。
20. 经常说眼睛有希望。

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

Prevent Blindness North Carolina
OUR VISION IS VISION®

A Lifetime of Healthy Vision
Vision should not be a barrier to learning, working, playing, or living independently.

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 (established in 1908), 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

Thank you for your TIME and ATTENTION. . .



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