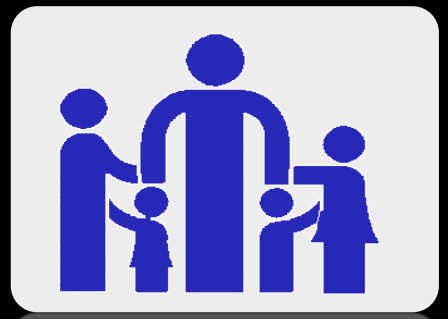
CHDP PEDIATRIC VISION SCREENING



Child Health and Disability Prevention (CHDP) Program
Systems of Care Division (SCD)
California Department of Health Care Services

LEARNING OBJECTIVES

- Understand the importance of vision screening during childhood.
- Become aware of eye problems that affect vision.
- Describe and implement the CHDP program guidelines for referral and follow-up.
- Identify the steps of vision screening and document results.

WHY PERFORM VISION SCREENING?

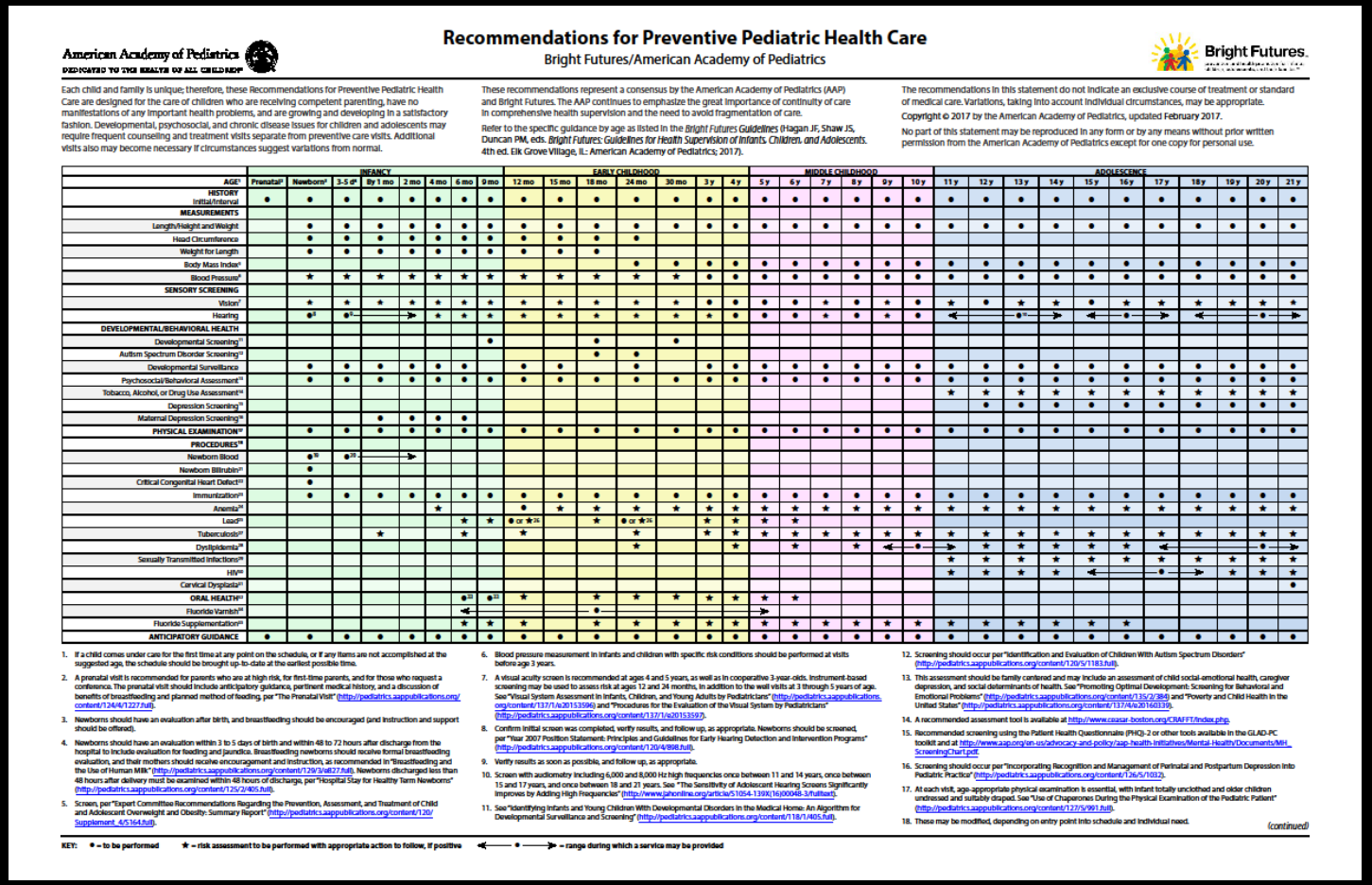
- Recommended as part of the American Academy of Pediatrics
- For ages where risk assessment is required, see Bright Futures Pre-visit Questionnaire
  - Available in all ages

CHDP Vision Screening Certification Requirements:

Screeners must attend Vision Screening Training led by CHDP staff (or another agency approved by local CHDP).

Renew certification every four years.

Bright Futures Periodicity Schedule



American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN

Recommendations for Preventive Pediatric Health Care

Bright Futures/American Academy of Pediatrics

Bright Futures

Each child and family is unique; therefore, these Recommendations for Preventive Pediatric Health Care are designed for the care of children who are receiving competent parenting, have no manifestations of any important health problems, and are growing and developing in a satisfactory fashion. Developmental, psychosocial, and chronic disease issues for children and adolescents may require frequent counseling and treatment visits separate from preventive care visits. Additional visits also may become necessary if circumstances suggest variations from normal.

These recommendations represent a consensus by the American Academy of Pediatrics (AAP) and Bright Futures. The AAP continues to emphasize the great importance of continuity of care in comprehensive health supervision and the need to avoid fragmentation of care.

Refer to the specific guidance by age as listed in the *Bright Futures Guidelines* (Hagan JF, Shaw JS, Duncan PM, eds. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*. 4th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2017).

The recommendations in this statement do not indicate an exclusive course of treatment or standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

	INFANCY							EARLY CHILDHOOD							MIDDLE CHILDHOOD						ADOLESCENCE										
AGE[1]	Prenatal[2]	Newborn[3]	3-5 d[4]	By 1 mo	2 mo	4 mo	6 mo	9 mo	12 mo	15 mo	18 mo	24 mo	30 mo	3 y	4 y	5 y	6 y	7 y	8 y	9 y	10 y	11 y	12 y	13 y	14 y	15 y	16 y	17 y	18 y	19 y	20 y	21 y
HISTORY Initial/Interval	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MEASUREMENTS																																
Length/Height and Weight		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Head Circumference		●	●	●	●	●	●	●	●	●	●	●																				
Weight for Length		●	●	●	●	●	●	●	●	●	●																					
Body Mass Index[5]												●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Blood Pressure[6]		★	★	★	★	★	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SENSORY SCREENING																																
Vision[7]		★	★	★	★	★	★	★	★	★	★	★	★	●	●	●	●	★	●	★	●	★	●	★	●	★	●	★	★	★	★	★
Hearing		●[8]	●[9]	→	→	★	★	★	★	★	★	★	★	★	●	●	●	★	●	★	●	←	●	●	→	←	●	→	←	●	→	←	● →
DEVELOPMENTAL/BEHAVIORAL HEALTH																																
Developmental Screening[10]							●				●		●																			
Autism Spectrum Disorder Screening[11]											●	●																				
Developmental Surveillance		●	●	●	●	●	●		●	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Psychosocial/Behavioral Assessment[12]		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tobacco, Alcohol, or Drug Use Assessment[13]																						★	★	★	★	★	★	★	★	★	★	★
Depression Screening[14]																							●	●	●	●	●	●	●	●	●	●
Maternal Depression Screening[15]				●	●	●	●																									
PHYSICAL EXAMINATION[16]		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PROCEDURES[17]																																
Newborn Blood		●[10]	●[10]	→	→																											
Newborn Bilirubin[18]		●																														
Critical Congenital Heart Defect[19]		●																														
Immunizations[20]		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Anemia[21]						★			●	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Lead[22]							★	★	● or ★[24]		★	● or ★[24]		★	★	★	★																
Tuberculosis[23]				★			★		★			★		★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Dyslipidemia[24]												★			★		★		★	←	●	→	★	★	★	★	★	←	●	→	★	★	★
Sexually Transmitted Infections[25]																							★	★	★	★	★	★	★	★	★	★	★
HIV[26]																							★	★	★	★	←	●	→	★	★	★	★
Cervical Dysplasia[27]																																●
ORAL HEALTH[28]							●[11]	●[11]	★		★	★	★	★	★	★	★															
Fluoride Varnish[29]							←	→			●					→																
Fluoride Supplementation[30]							★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★					
ANTICIPATORY GUIDANCE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

1. If a child comes under care for the first time at any point on the schedule, or if any items are not accomplished at the suggested age, the schedule should be brought up-to-date at the earliest possible time.
2. A prenatal visit is recommended for parents who are at high risk, for first-time parents, and for those who request a conference. The prenatal visit should include anticipatory guidance, pertinent medical history, and a discussion of benefits of breastfeeding and planned method of feeding, per "The Prenatal Visit" (http://pediatrics.aappublications.org/content/124/4/1227.full).
3. Newborns should have an evaluation after birth, and breastfeeding should be encouraged (and instruction and support should be offered).
4. Newborns should have an evaluation within 3 to 5 days of birth and within 48 to 72 hours after discharge from the hospital to include evaluation for feeding and jaundice. Breastfeeding newborns should receive formal breastfeeding evaluation, and their mothers should receive encouragement and instruction, as recommended in "Breastfeeding and the Use of Human Milk" (http://pediatrics.aappublications.org/content/129/3/e827.full). Newborns discharged less than 48 hours after delivery must be examined within 48 hours of discharge, per "Hospital Stay for Healthy Term Newborns" (http://pediatrics.aappublications.org/content/125/2/405.full).
5. Screen, per "Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report" (http://pediatrics.aappublications.org/content/120/Supplement_4/S164.full).
6. Blood pressure measurement in infants and children with specific risk conditions should be performed at visits before age 3 years.
7. A visual acuity screen is recommended at ages 4 and 5 years, as well as in cooperative 3-year-olds. Instrument-based screening may be used to assess risk at ages 12 and 24 months, in addition to the well visits at 3 through 5 years of age. See "Visual System Assessment in Infants, Children, and Young Adults by Pediatricians" (http://pediatrics.aappublications.org/content/131/1/e20153596) and "Procedures for the Evaluation of the Visual System by Pediatricians" (http://pediatrics.aappublications.org/content/137/1/e20153597).
8. Confirm initial screen was completed, verify results, and follow up, as appropriate. Newborns should be screened, per "Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs" (http://pediatrics.aappublications.org/content/120/4/898.full).
9. Verify results as soon as possible, and follow up, as appropriate.
10. Screen with audiometry including 6,000 and 8,000 Hz high frequencies once between 11 and 14 years, once between 15 and 17 years, and once between 18 and 21 years. See "The Sensitivity of Adolescent Hearing Screens Significantly Improves by Adding High Frequencies" (http://www.jahonline.org/article/S1054-139X(16)00048-3/fulltext).
11. See "Identifying Infants and Young Children With Developmental Disorders in the Medical Home: An Algorithm for Developmental Surveillance and Screening" (http://pediatrics.aappublications.org/content/118/1/405.full).
12. Screening should occur per "Identification and Evaluation of Children With Autism Spectrum Disorders" (http://pediatrics.aappublications.org/content/120/5/1183.full).
13. This assessment should be family centered and may include an assessment of child social-emotional health, caregiver depression, and social determinants of health. See "Promoting Optimal Development: Screening for Behavioral and Emotional Problems" (http://pediatrics.aappublications.org/content/135/2/384) and "Poverty and Child Health in the United States" (http://pediatrics.aappublications.org/content/137/4/e20160339).
14. A recommended assessment tool is available at http://www.ceasar-boston.org/CRAFFT/index.php.
15. Recommended screening using the Patient Health Questionnaire (PHQ)-2 or other tools available in the GLAD-PC toolkit and at http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Documents/MH_ScreeningChart.pdf.
16. Screening should occur per "Incorporating Recognition and Management of Perinatal and Postpartum Depression Into Pediatric Practice" (http://pediatrics.aappublications.org/content/126/5/1032).
17. At each visit, age-appropriate physical examination is essential, with infant totally unclothed and older children undressed and suitably draped. See "Use of Chaperones During the Physical Examination of the Pediatric Patient" (http://pediatrics.aappublications.org/content/127/5/991.full).
18. These may be modified, depending on entry point into schedule and individual need.

(continued)

KEY: ● = to be performed ★ = risk assessment to be performed with appropriate action to follow, if positive ← ● → = range during which a service may be provided

WHY PERFORM VISION SCREENING?

Primary Care Physicians and Nurses:

- The first line of defense to detect preventable vision loss in children

Early detection of amblyopia - "lazy eye"

- Leading cause of vision loss among children

HOW DOES HEALTH EQUITY COME INTO PLAY?

- Children experience different access to healthcare based on socioeconomic status and other social factors
- This means that some groups are disproportionately lacking healthcare (preventative or not)
- This perpetuates health disparities that we see in our communities

"Health equity is achieved when every person has the opportunity to "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances." Health inequities are reflected in differences in length of life; quality of life; rates of disease, disability, and death; severity of disease; and access to treatment."

- CDC

Structural Racism

A history and current reality of institutional racism across all institutions, combining to create a system that negatively impacts communities of color.

Institutional Racism

Policies, practices, and procedures that work better for white people than for people of color, often unintentionally.

https://www.racialequityalliance.org/

AMBLYOPIA

Leading cause of vision loss among children.

- Eyes and brain are not working together. One eye sees a blurred view and the other a normal view. The brain only processes the normal view.

Common causes: Untreated or unequal refractive errors (near/farsighted, astigmatism)

- Strabismus "crossed eyes," Obstruction (e.g. ptosis, cataract)

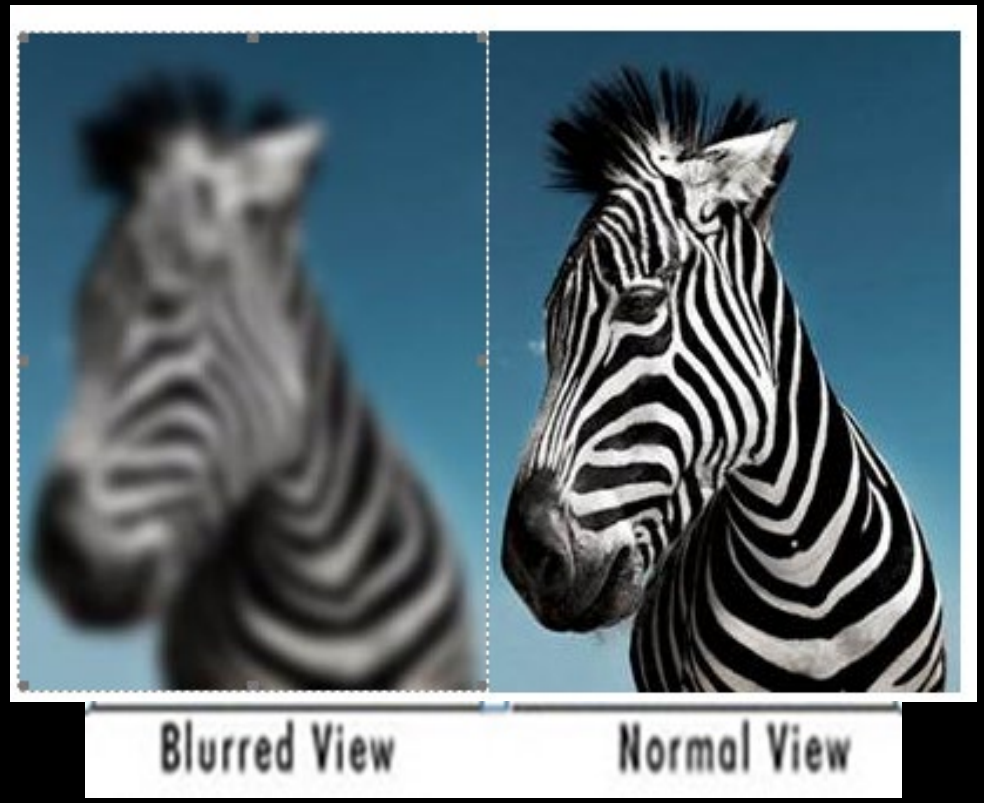
Screen Early! School-aged vision screening may be too late.

- Amblyopia is harder to treat after 5 years of age.
- By 7 years of age, some vision loss from amblyopia may become permanent.

AMBLYOPIA

Amblyopia can only develop during childhood.

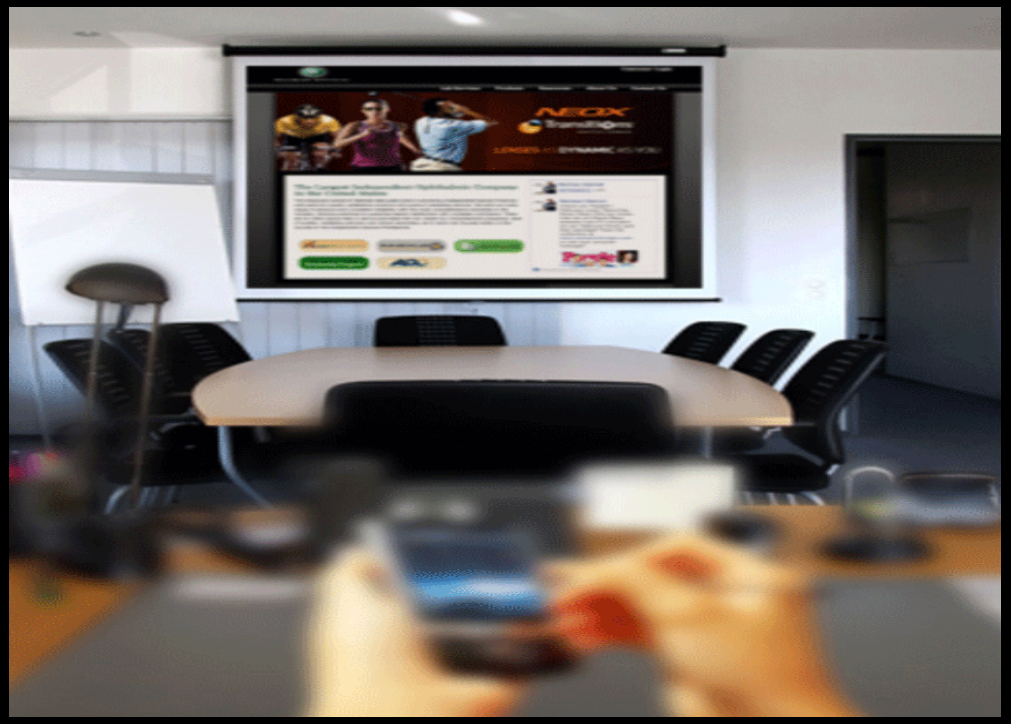
- If not treated in childhood, amblyopia may result in permanent vision loss.
- The most common cause of vision loss in adults 20-70 years of age is untreated childhood amblyopia.



COMMON CAUSES OF AMBLYOPIA
1. TYPES OF REFRACTIVE ERRORS

a. Myopia "nearsighted": does not see objects well at far distances

b. Hyperopia "farsighted": does not see objects well at close distances

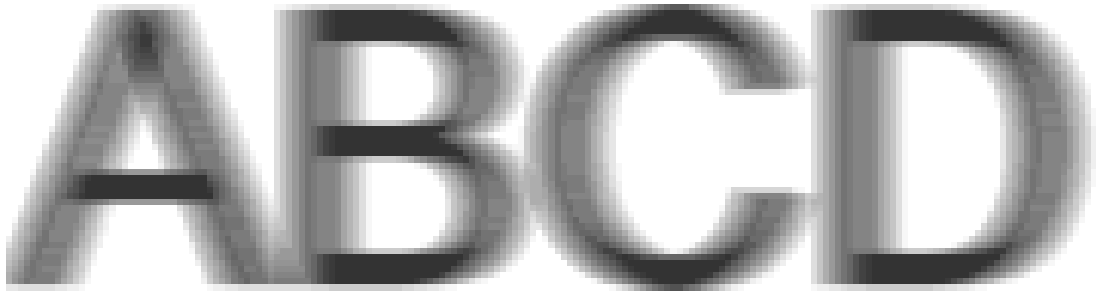


COMMON CAUSES OF AMBLYOPIA

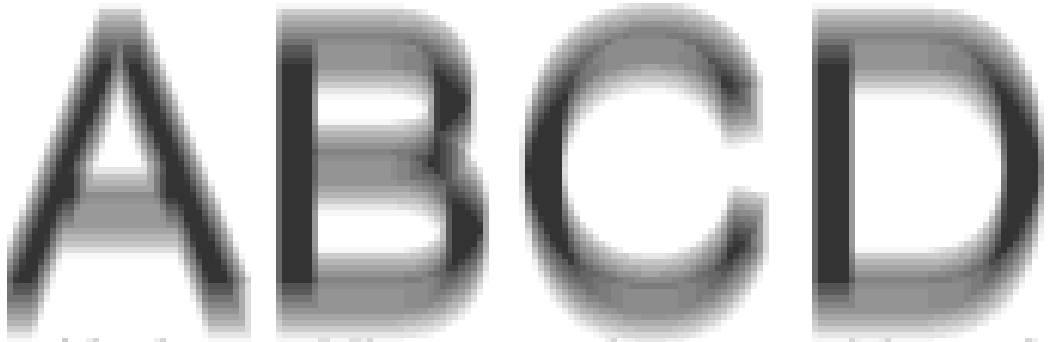
Types of refractive errors continued

c. Astigmatism: an irregular curve in the eye causing blurry vision at all distances

Astigmatism causes blur along one direction



Vertical lines may be more blurred



Horizontal lines can be more blurred

COMMON CAUSES OF AMBLYOPIA

2. Strabismus "crossed eyes": misalignment of the eyes (May have double vision)

- One or both eyes turning inward

- One or both eyes turning outward

- One eye turning up or down

COMMON CAUSES OF AMBLYOPIA

3. Obstruction
   a. Ptosis: drooping of an eyelid due to a weak lid muscle.
      - May obstruct vision
      - Look for chin elevation in these children.
   b. Cataract: condition in which the lens of the eye becomes progressively cloudy resulting in blurred vision.

VISION SCREENING IN THE UNITED STATES

National Eye Institute (NEI)

- Amblyopia affects 2-3% of children in the United States.
- About 4.5 million children with preventable vision loss.

Barriers to Screening

- Poor cooperation of young children
- Takes time to perform
- Staff not adequately trained
- Poor reimbursement for physicians

VISUAL ACUITY SCREENING GUIDELINES

AMERICAN ACADEMY OF PEDIATRICS POLICY STATEMENT

Pediatrics January 2016

- Screening with a tool such as a photoscreener is recommended for children 12 months of age and older unless they can reliably perform visual acuity screening with eye charts.
- Visual acuity screening using eye charts remains the gold standard. It can begin as early as 3 years of age.

NEWBORN TO 35 MONTHS (0-3 YEARS)

Procedures for the Evaluation of the Visual System

Pediatrics January 2016

- Take a health history: Are there eye problems in close relatives?
- Check vision (tracking), eye movement (motility) and alignment (strabismus)
- Check pupils and red reflexes (round, equal, bright)

NOTE: This assessment can also be done on older children of any age with developmental delays.

36 TO 47 MONTHS (3 YEARS)

- Must be able to identify the majority of the 20/50 line with each eye.
- Screening is typically done at 10 feet.
- Opposite eye must be fully covered.

48 to 59 Months (4 years)

Must be able to identify the majority of the 20/40 line with each eye.
Screening is typically done at 10 feet.
Opposite eye must be fully covered.

60 MONTHS AND OLDER (5+ YEARS)

- Must be able to identify the majority of the 20/32 line (or 20/30 in Snellen chart) with each eye.
- Use LEA symbols, HOTV letters for children who do not know their letters.
- Use Sloan letters for children who know their letters.
  - Preferred over Snellen letters chart
  - Snellen letters chart have a 20/30 line

60 MONTHS AND OLDER (5+ YEARS)

- Recommended screening distance is 10-feet using a 10-foot chart.
- Fully cover opposite eye.
- Repeat screening every 1-2 years.
- Risk assessment should be done when screening is not required.

FOR SCREENING AT 10 FEET

AGE-DEPENDENT PASS/FAIL GUIDELINES

- **New AAP guidelines**
  - **3 years old**: the critical line to pass screening is the **20/50** line.
  - **4 years old**: the critical line to pass screening is the **20/40** line.
  - **5 years and older**: the critical line to pass screening is the **20/32** line for Sloan and LEA/HOTV (or **20/30** in Snellen chart).

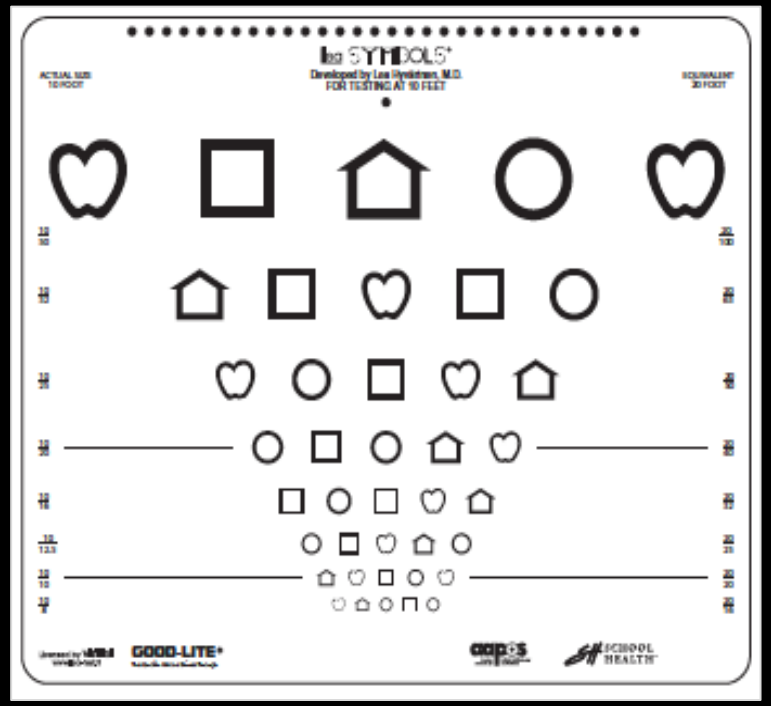
AGE-DEPENDENT REFERRAL CRITERIA

New AAP Guidelines:

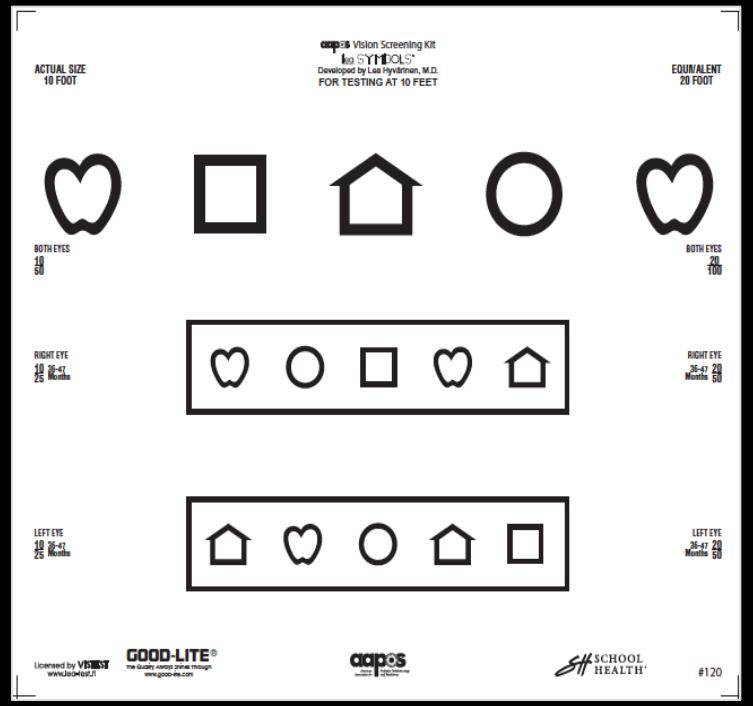
- 3 years old: Missing 3 or more symbols on the 20/50 line, or any line above the 20/50 line, with either eye
- 4 years old: Missing 3 or more symbols on the 20/40 line, or any line above the 20/40 line, with either eye
- 5 years and older: Missing 3 or more symbols on the 20/32 (20/30) line, or any line above the 20/32 (20/30) line, with either eye
- Two line difference between the eyes, even within the passing range (e.g. 20/20 and 20/32)

THRESHOLD AND CRITICAL LINE OPTIONS

Threshold



Critical Line

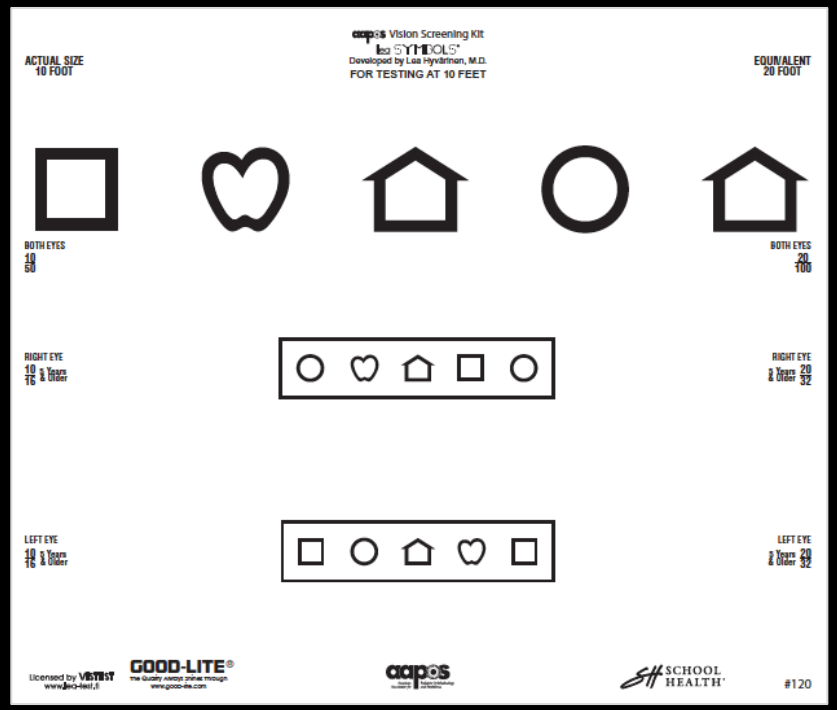


THRESHOLD SCREENING

- Reading down the eye chart as far as possible.
- Threshold line is the smallest line child can pass.
- Can identify 2-line difference between the eyes.

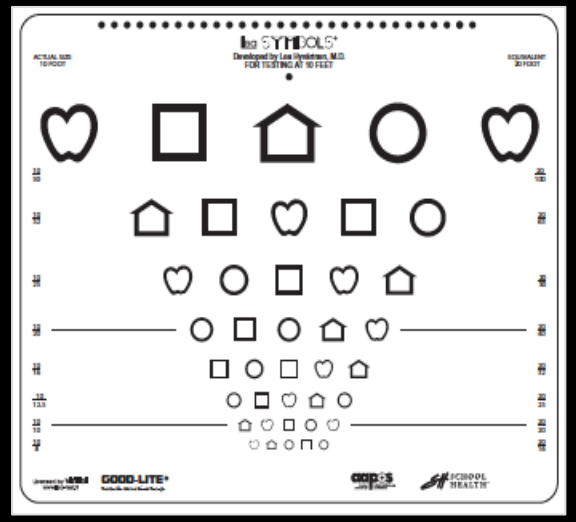
CRITICAL LINE SCREENING: FASTER

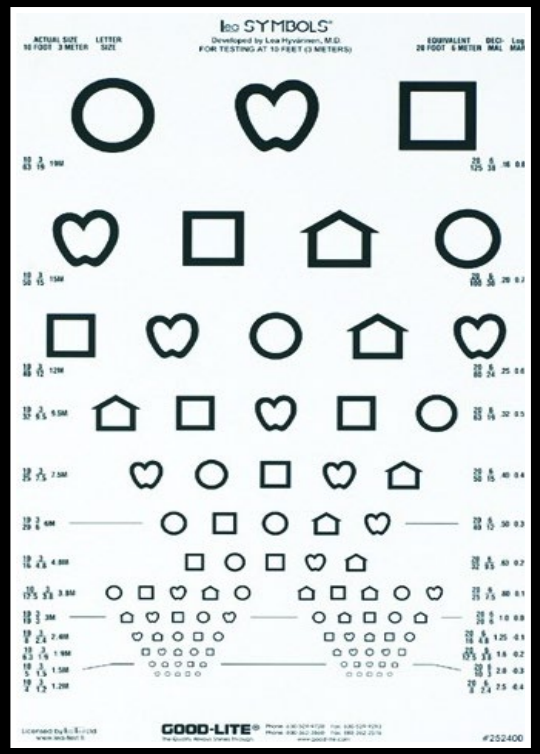
- Only read a single "critical" line with each eye.
- Each chart has two boxed "critical lines" - one for each eye. The top line of large optotypes (symbols/letters) is for practice before starting screening.



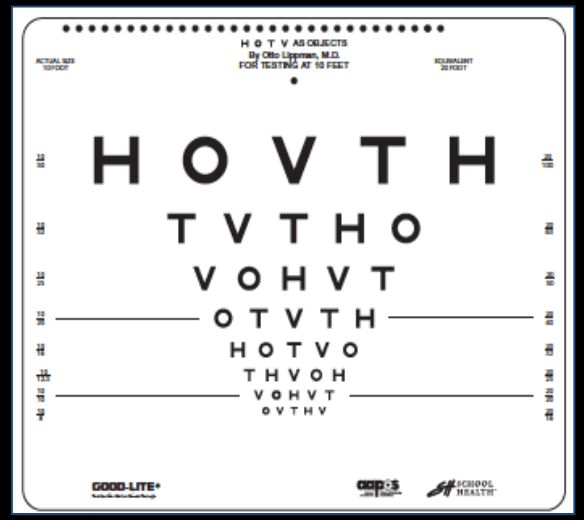
AGES 3 THROUGH 5 YEARS RECOMMENDED CHART TYPES

LEA Symbols





HOTV Letters



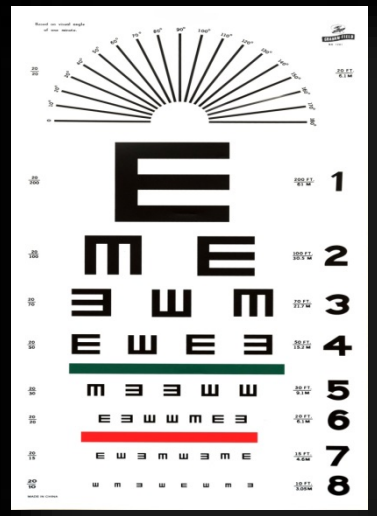
60 MONTHS AND OLDER (5+ YEARS)

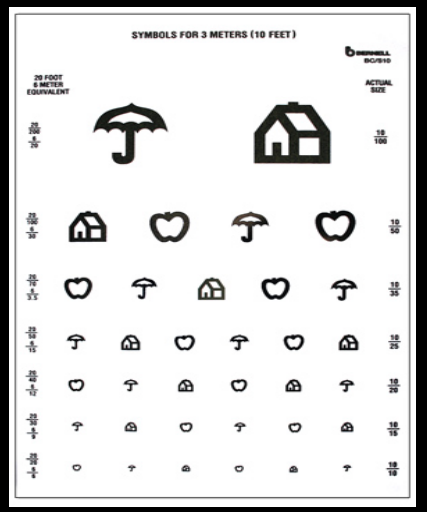
- Sloan Letters Chart
  - Preferred over Snellen Letters.

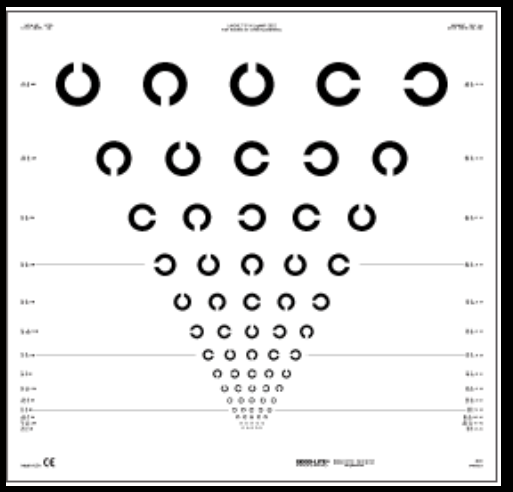
SLOAN

SNELLEN

VISION SCREENING CHARTS NOT RECOMMENDED







OCCLUSION OF NON-TESTED EYE

- Adhesive patches are best.
- For all screening methods, completely cover the eye not being screened to prevent peeking.

OCCLUDERS

Acceptable

Only for age 10 years and older

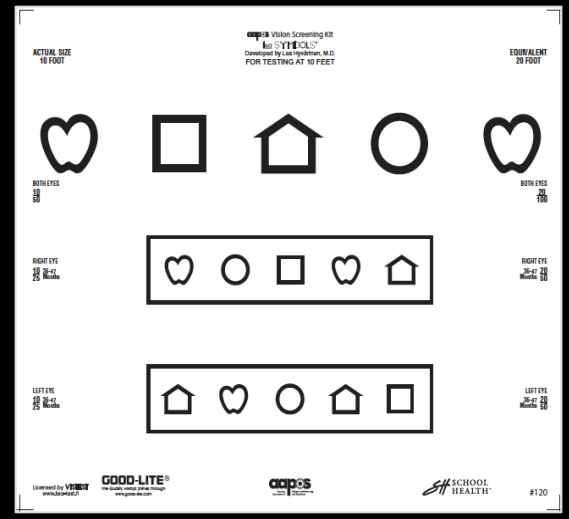
Not Recommended

AMERICAN ASSOCIATION FOR PEDIATRIC OPHTHALMOLOGY AND STRABISMUS (AAPOS) VISION SCREENING KIT

- Acuity charts for threshold or critical line screening:
  - Sloan letters
  - LEA symbols or HOTV letters
- Occluder patches/glasses/paddle
- 10 foot measuring cord
- Matching response card
- Informational DVDs

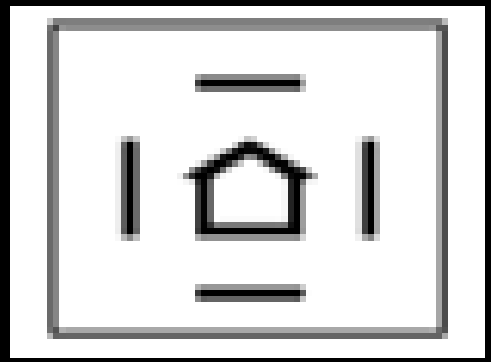
KEY POINTS

- Use eye charts with lines of optotypes or matching cards with lines (crowding bars) around each optotype to obtain the most accurate visual acuity assessment.



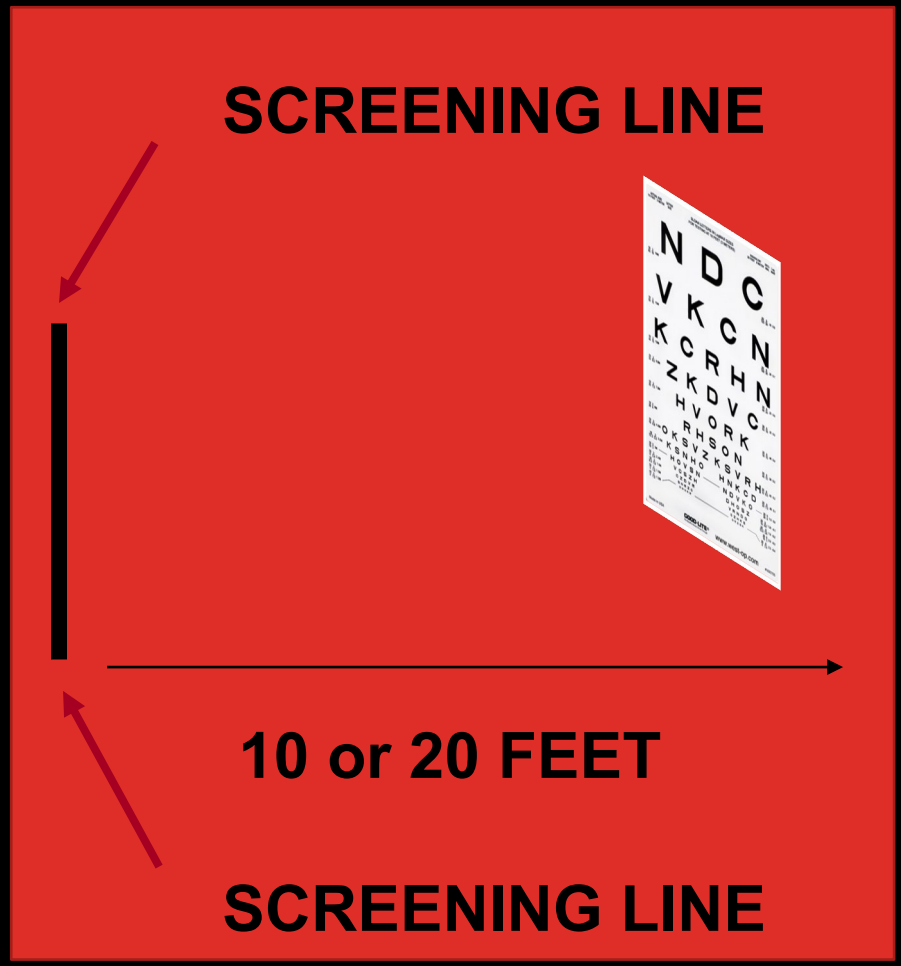
- Crowding bars around the optotype make individual symbols/letters more difficult to identify when amblyopia is present.

- Eye chart should be at child's eye level.
- Each eye should be screened separately (monocularly).
- Either critical line or threshold screening may be used.



KEY POINTS

- Screening line marked at 10 (or 20)-feet on the floor.
- Screening line is directly in front of eye chart.
- Vision screening area
  - Out of traffic area
  - Have adequate lighting



AUTOMATIC REFERRAL FOR EYE EXAM

Children with the following disorders should bypass screening and should be referred directly to an eye specialist:

1. Recognized eye disorders (e.g. strabismus, ptosis)
2. Known neurodevelopmental disorders: Hearing impairment, Motor abnormalities (e.g. cerebral palsy), Down Syndrome, Cognitive impairment, Autism spectrum disorder, Speech delay
3. Systemic diseases present (e.g. diabetes, sickle cell disease, hypertension)
4. Taking medications known to cause eye disorders (e.g. some anti-depressants and steroids)
5. First-degree relative with strabismus or amblyopia
6. Prematurity: less than 32 weeks of gestation
7. Parent believes child has vision problem

UNTESTABLE CHILDREN

- If child is unable to cooperate during the screening, make a second attempt the same day (i.e. later during the same visit). If same day rescreening is not possible, reschedule as soon as possible, but no later than 6 months.
- Schedule follow up appointment prior to the patient leaving provider office.
- If you cannot screen a child, then refer to an ophthalmologist or optometrist experienced in the care of children for an eye examination.

FOLLOW-UP

- Maintain referral log to track status of referral.
- Follow-up with parent/guardian as needed.

	REFERRAL DATE	PATIENT'S NAME	D.O.B.	PROVIDER REFERRED TO	SPECIALITY	DATE OF APPT	DATE CONSULT REC'D	7 DAY FOLLOW- UP	30 DAY FOLLOW-UP
01	07-20-07	Doe, Janet	3-6-00	MLK	OPTOMETRY	9-3-07	9-27-07	9-10-07 Exam Done	10-3-07 Glasses Rec'd
02									
03									
04									
05									
06									
07									
08									
09									
10									
11									
12									

SPECIALTY:

P Pediatrics	OR Ortho	G Gyn	N Neurology	C Cardiology	S Surgery	D Dermatology	E ENT
T Family Plan.	OT Optometry	B GYN/BTL	R Radiology	V Vascular Surg	AU Audiology	PT Physical Therapy	U Ultrasound
H Hemo-Oncology	OB Obstetrics	OP Opthal.	GU Urology				

INSTRUMENT-BASED VISION SCREENING

- Instrument-based screening is the process of using an instrument such as a photoscreener, autorefractor or other device, to screen for risk factors for vision problems.
- Does not replace visual acuity screening with eye charts.
- Endorsed by American Academy of Pediatrics (AAP).

INSTRUMENT SCREENING IS USEFUL FOR:

- All children ages 1-3 years
  - Usually unable to perform visual acuity screening
- Some children ages 3-5 years
  - Acuity chart screening is preferred, but…
  - Instrument-based screening is an acceptable alternative.
- Older children who are non-verbal, developmentally delayed or otherwise unable to perform screening with acuity charts.

WHAT IS THE DIFFERENCE BETWEEN VISION SCREENING WITH EYE CHARTS AND VISION SCREENING WITH DEVICES?

- Vision screening with eye charts measure the actual visual acuity (e.g. 20/20).
- Vision screening devices DO NOT measure visual acuity directly.
  - Screening instruments test for eye conditions or risk factors that are known to cause decreased vision or amblyopia.

COMMON VISION SCREENING INSTRUMENTS

Welch Allyn SureSight

Righton Retinomax

iScreen

PlusOptix S12R

Welch Allyn "Spot"

CONGRATULATIONS!

- You have completed Step One!
- Next Steps
  1. Practicum
  2. After practicum, you will receive a certificate of completion from the CHDP office

Certificates are good for four years!

ACKNOWLEDGMENTS

- These guidelines are based on recommendations from the American Academy of Pediatrics (AAP) and the National Expert Panel of the National Center for Children's Vision and Eye Health (NCCVEH) at Prevent Blindness.
- These slides have been adapted from the American Association for Pediatric Ophthalmology and Strabismus (AAPOS) with their permission.

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