Pre-testing for Preschool Children Made Easy

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Financial Disclosures

- None

Vision Testing

- Vision screening
- Comprehensive eye exam
- InfantSee

Rationale for Screening / Eye Exams

- Early detection & treatment to maximize potential
- Prevent vision loss and/or loss of binocularity
- Undiagnosed vision disorders can interfere with visual development +/- learning
- Plasticity of visual system

Purpose of Testing Preschoolers

- Detect significant vision problems
  - Amblyopia
  - Strabismus
  - Significant refractive error
  - Ocular disease
  - Color vision defects

Amblyopia

- Reduced visual acuity in one or both eyes
- Not from ocular pathology & not correctable with optical correction
- From strabismus, anisometropia, or obstruction of visual axis present < 6 yrs
- Most common cause of vision loss in children
Strabismus

- Esotropia
- Exotropia

Significant Refractive Error

- Hyperopia
- Myopia
- Astigmatism
- Anisometropia

Refractive Error - Myopia

- Condition where the focus is in front of the retina.
- Nearsightedness
- Blur at distance

Refractive Error - Hyperopia

- Condition where the focus is behind the retina.
- Farsightedness
- No blur at distance or near if sufficient accommodation

Astigmatism

- Condition where the focus is not uniform
- Different refractive error in 2 principal meridians
- Blur at near and far

Anisometropia

- Two eyes have a different refractive error
- Can lead to amblyopia in children <6 yrs
Important Considerations

- Scheduling
- Environment
- Establishing rapport

Appointment Time

- Schedule appointment when child is alert

Other Considerations

- Bring bottle, snacks, favorite toy/blankie
- No young siblings unless caretaker

Environment

- Examination Equipment

Other Considerations

- Staff assistance: target control, recording, etc.
- Seat infant on parent’s lap, in parent’s arms, or on lap pillow
- Allow cool down period if baby becomes too fussy
- Make noises
- Objective testing
General Guidelines
- Age-appropriate targets / techniques
- Be flexible
- Work quickly and keep talking
- Give praise and positive reinforcement

Case History
- Chief complaint
- Signs/symptoms
- Eye & medical hx
- Child & family
- Birth history
  - LBW <2500g
  - Preterm <37wks
- Development
  - Motor (gross/fine)
  - Speech/language

The Working Position

Preschool Routine Eye Examination
Minimum Data Base
- Eye Alignment
- Visual Acuity
- Refraction
- Ocular Health
- Color (Preschoolers)

Eye Alignment
- Observation
- RDS (preschoolers)
- Cover testing
- Hirschberg/Krimsky
- Brückner

Random Dot Stereopsis Tests
- Randot
- Lang I/II
- Random Dot E
- Randot Preschool
- Randot 2

Advantages
- No monocular cues
- Nonverbal; can point
Cover Testing - Distance

Cover Testing at Near

Target Choice

Alternate Cover Testing - Near

Hirschberg Testing

Hirschberg Testing
Krimsky Test

Versions for EOMs

Visual Acuity
- Is vision normal for age & equal?
- Monocular distance acuity

Visual Acuity for Preschoolers

Monocular Distance

Desirable Characteristics of VA Test for Preschoolers
- High contrast, single, isolated optotypes
- 2-alternative forced choice or matching
- Avoid verbal or directional response
- Reduced testing distance (10 feet)
- Crowding bars

Preschool Visual Acuity Testing
- Snellen?
  * HOTV
  * LEA symbols

Demo First

Snellen

Preschool Visual Acuity
HOTV

HOTV (EVA) Threshold Testing

<table>
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<th>Age in months</th>
<th>30 - 35</th>
<th>36 - 45</th>
<th>46 - 55</th>
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<td>182</td>
<td>186</td>
<td>180</td>
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<tr>
<td>Female participants</td>
<td>184</td>
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<td>180</td>
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<td>Total</td>
<td>368</td>
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<td>372</td>
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3126 Hispanic & African-American children
MEPEDS: Population-based study

LEA Optotypes

Replace These
Teller Acuity Cards

Infant Methods: Fix & Follow

Other Indirect VA Measures
- Fix and follow
- Resistance to occlusion

Assess Refractive Error
- Retinoscopy**
- Autorefraction?

Retinoscopy

Cycloplegic Examination
Cycloplegic Refraction

- Topical anesthetic
- 2 gtts cyclopentolate
  - 1% for children >1 year
  - 0.5% for children <1 year
- Tropicamide for mydriasis
- 30 minutes refraction

Hand-held Autorefractors

- Welch Allyn Sure Sight®
- Retinomax

MEPEDS testability 6-12 mo
63% (250/403)


Assess Ocular Health

- Pupils
- Anterior segment
- Posterior segment

Anterior Segment

Posterior Segment

Intraocular Pressure?

- Tonopen
- NCT
- Goldmann
- Digital?
Assessing Color Vision
- 8-10% males; <0.5% females
- Color identification / discrimination required during early education

Color Vision Testing Made Easy Test

Reward Time