The ABC’s of Stress-Free Eye Care for Infants & Young Children

Patient photos removed from slides for handout

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Rationale for Examination
- Early Detection/Prevention/Treatment
  - Vision loss
  - Loss of binocularity
  - Eye health
  - Visual system plasticity

General Strategy
- Schedule appointment when child is alert

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

Waiting Room

Examination Equipment
Targets: Variety & Close By

The Working Position

Work Quickly & Be Flexible

Positive Reinforcement

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

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

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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

Randot Stereotest

Random Dot E Stereotest

Lang Stereotest
Randot Preschool Stereotest

Random Dot Test (LEA)

Cover Testing - Distance

Cover Testing at Near

Target Choice

Alternate Cover Testing - Near
Hirschberg Testing

Krimsky Test

Brückner Test

Brückner Test

Versions for EOMs
Visual Acuity
- Is vision normal for age & equal?
- Assess directly or indirectly

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

E
F
P
T
O
Z
L
P
E
D
K
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
HOTV (EVA) Threshold Testing

<table>
<thead>
<tr>
<th>Age in months</th>
<th>No of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 - 36</td>
<td>356</td>
</tr>
<tr>
<td>37 - 48</td>
<td>982</td>
</tr>
<tr>
<td>49 - 59</td>
<td>980</td>
</tr>
<tr>
<td>60 - 72</td>
<td>826</td>
</tr>
<tr>
<td>Total</td>
<td>2,046</td>
</tr>
</tbody>
</table>

3126 Hispanic & African-American children
MEPES: Population-based study

LEA Optotypes

Replace These

Monocular Visual Acuity
Toddlers
Cardiff Cards

Monocular Visual Acuity
Infants

Teller Acuity Cards
Methods: Fixation Preference

- Apparent strabismus: Habitually fixing eye occluded & nonfixing eye observed when habitually fixing eye uncovered
- No manifest strabismus or ≤10Δ: ITT (12ΔBD)

### Fixation Preference Criteria

<table>
<thead>
<tr>
<th>Grade</th>
<th>Observation made by doctor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Spontaneous alleviation</td>
</tr>
<tr>
<td>B</td>
<td>Fixation held with non-preferred eye for:</td>
</tr>
<tr>
<td></td>
<td>- ≥3 seconds, OR</td>
</tr>
<tr>
<td></td>
<td>- during smooth pursuit, OR</td>
</tr>
<tr>
<td></td>
<td>- through a blink</td>
</tr>
<tr>
<td></td>
<td>before refixation to preferred eye</td>
</tr>
<tr>
<td>C</td>
<td>Grade: Momentarily</td>
</tr>
<tr>
<td></td>
<td>Fixation held with non-preferred eye for 1-3 seconds</td>
</tr>
<tr>
<td>D</td>
<td>Does not hold</td>
</tr>
<tr>
<td></td>
<td>Immediate (&lt;1 sec) refixation with preferred eye when occluder removed from preferred eye</td>
</tr>
</tbody>
</table>

Sensitivity of FP Testing

- For detecting:
  - Any amblyopia = 31% (17/55)
  - Anisometropic amblyopia = 20% (8/40)
  - Strabismic amblyopia = 80% (8/10)

  MEPEDS preschool children 30-72 months

FP: False Positives

- Include high number of strabismic children
- Of strabismic kids with grade C/D FP, only 32% (8/25) had amblyopia

Other Indirect Measures

- Fix and follow
- Resistance to occlusion

Assess Refractive Error

- Retinoscopy**
- Autorefraction?
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?

Color Vision Testing Made Easy Test

Minimum Data Base
- Eye Alignment
- Refraction
- Visual Acuity
- Ocular Health
- Color Vision

Reward Time