amblyoplay®

Binocular Vision Assessment Tips And Flows

1. Patient & family history

- History of strabismus (onset, deviation, constant/intermittent)
- History of prematurity

2. Anamnesis (if patient can communicate)

- Symptoms
- Questionnaire or survey

3. Observation

- Signs of reported symptoms
- Face and head shape
- Body posture
- Pseudostrabismus or epicanthus
- Symmetry of the corneal reflections
- Check for motility and smooth pursuit movements

4. Tests

- The Brückner Test (test screens for strabismus, anisometropia, media opacities, abnormal pupil reactions, and fundus anomalies near the visual axis)
- Visual Acuity (VA or BCVA)
- Refraction: Objective and Subjective refraction, Retinoscopy (Cycloplegic retinoscopy remains the gold standard test of refractive error. Alternatively Mohindra (near) retinoscopy could be a useful noncycloplegic technique to identify or monitor infant refractive error without dilation)
- Ocular motility (checking the 6 positions of gaze for smooth pursuit)
- The Vestibulo-Ocular Reflex (VOR) (useful way of assessing both gross visual acuity and ocular motility. Same technique can be used for checking the full adduction or abduction)
- Cover / Uncover test (test for tropias and phorias)
- Induced Tropia test (Use of BD prism to check suppression)
- Motion detection (Monocular optokinetic nystagmus (OKN) can be elicited by repeated refixations on the vertical black/white gratings of an OKN drum or tape moving horizontally
- Strabismus Angle Assessment (alternate prism test, Krimsky test, Hirscberg test)
- Sensory binocularity (the Lang, Randot, Frisby, or TNO tests)

- Accommodation
  - Amplitude (NPA - near point of accommodation, minus lens method, Hofstetter's Equations, PRA - positive relative accommodation, NRA - negative relative accommodation, Mohindra retinoscopy)
  - Accuracy (Unfused Cross-Cylinder test - monocular or dissociated XCyl, Fused Cross-Cylinder Test - Binocular or Associated XCyl, MEM retinoscopy
  - Facility (Plus/Minus lens method - relative facility, Near-Far Accommodative Rock - Free space Facility)
- Vergence
  - Amplitude (NPR - near point of convergence, Relative vergence range with PRV - positive relative vergence (BO prisms) and NRV - negative relative vergence (BI prisms)
  - Accuracy
    - Dissociated vergence posture using one of the methods: Alternate cover test, vertical dissociating prisms in phoropter, stereoscope tests, anaglyphic tests, red lens, Maddox Rod
    - Heterophoria (aiming tendency of the vergence system, forms: orthophoria, esophoria (E), Exophoria (X), Hyperphoria (H), Hypophoria (Ho)
    - Heterotropia (abnormal condition of vergence posture with the absence of limit binocular vision, types: Esotropia (ET), Exotropia (XT), Hypertropia (HT), Hypotropia (HoT)
    - Tests: Unilateral and alternating cover test, von Graefe, Maddox Rod/Modified Thorington, Saladin Nearpoint Card, Sheedy disparometer, Wesson Card, Mallet Box, Vectographic slide, Mentor BVAT, Polatest, MKH method)
  - Facility (speed, agility) - Base IN / Base OUT prism flippers, Near-Far Rock
- ACA ratio (Accommodative convergence to Accommodation)
  - High AC/A ratios (>6:1) → vergence "excess" diagnosis
  - Low AC/A ratios (<3:1) → vergence "insufficiency" diagnosis
  - Average AC/A ratios → normal vergence postures, basic eso/exo

5. Ocular health assessment and systemic health screening

- Gross inspection of eyelids and adnexa
- Biomicroscopy
- Dilated or non-dilated fundus examination
- Systemic disease check up (eg. MS, DM, Graves disease, Myasthenia gravis) → can cause accommodative-vergence anomalies

6. Recommendations and prescription

- Glasses
- Contact lenses
- VT
- Surgical intervention
- Environmental factors
- Prevention and health habits discussion

7. Follow up