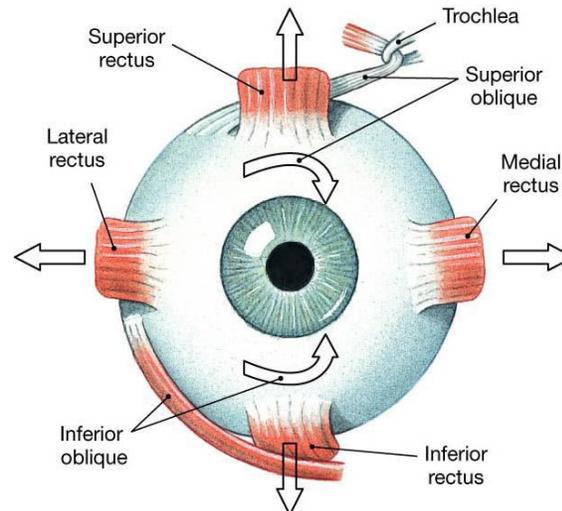


1:30 and 3:40PM – W10/W14: **Ocular Motility (Advanced – some motility experience is needed) (repeat of W14)**

Amy Jost, MEd, COMT, CCRC

This advanced course teaches technicians how to capture measurements and testing required to aid physicians in the diagnosis of diplopia, suppression and ocular alignment disorders. Demonstration of ocular motility, alignment testing and the measurement of deviations will be followed by hands-on practice with trainer guidance and feedback.

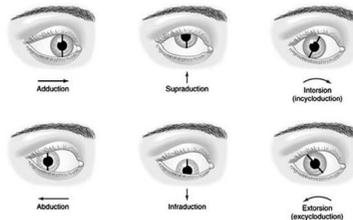
- Versions/Ductions Motility Testing
- Review of Cover Testing
- Stereopsis Test
- Worth 4 Dot Test
- Hirschberg Test
- Prism Correction



Ductions

Range of movement of **one eye**, independent from the other eye.

- **Adduction:** towards the nose
- **Abduction:** towards the ear
- **Supraduction:** Up
- **Infraduction:** Down
- **Incycloduction:** Rotate in
- **Excycloduction:** Rotate out



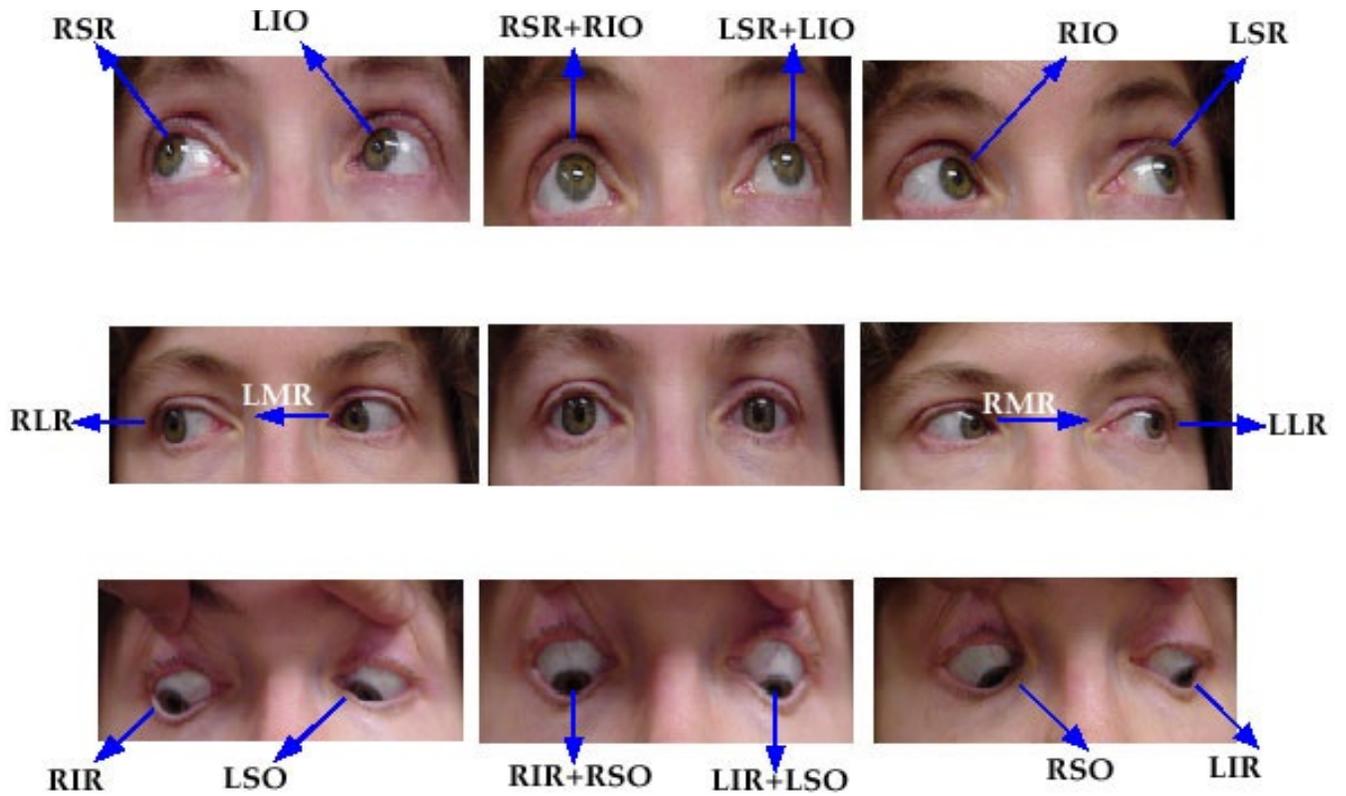
Right Eye

Versions

Both eyes moving in the same direction

- **Dextroversion** (both eyes to the right, as in picture below)
- **Levoersion** (to the left)
- **Supraersion** (upwards)
- **Infraersion** (downwards)

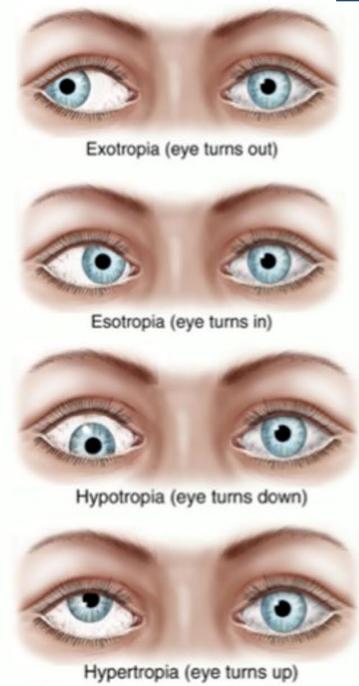




Deviations



- Ortho-** straight, no deviation
- Exo-** outward deviation (X, XT)
- Eso-** inward deviation (E, ET)
- Hypo-** downward deviation
- Hyper-** upward deviation (H, HT)



Cover-Uncover Alignment Test

Identify Tropias

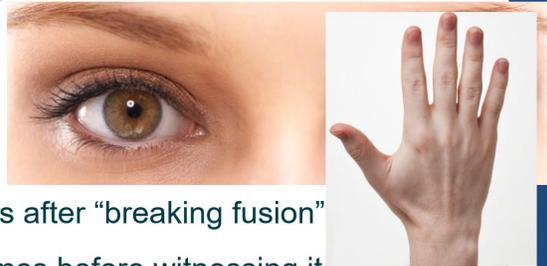


- **Tropia:** A misalignment that is always present, manifest
- The deviation is classified by the direction of the misalignment
- **Cover-Uncover test:**
 - Have the patient fixate on a distance target to avoid convergence that occurs with near fixation
 - Cover and uncover one eye at a time, about 3 times,
 - Observe the eye not being covered for any movement
 - The eye will move to fixate if there is a deviation

NOTE: Must perform Cover-Uncover BEFORE Cross-Cover Testing

Cross-Cover Alignment Test

Identify Phorias



- **Phoria:** A misalignment that appears after “breaking fusion”
- May have to cross-cover multiple times before witnessing it
- The deviation is classified by the direction of the misalignment; both eyes will move to pick up fixation
- **Cross-Cover Test:**
 - Continue to fixate on a distance target
 - Cover one eye at a time, swing back and forth
 - Observing the eye not being covered
 - Deviation is where the movement

NOTE: Tropias will turn into Phorias.

Stereopsis

Titmus Stereo Fly test

Consists of various vectograms

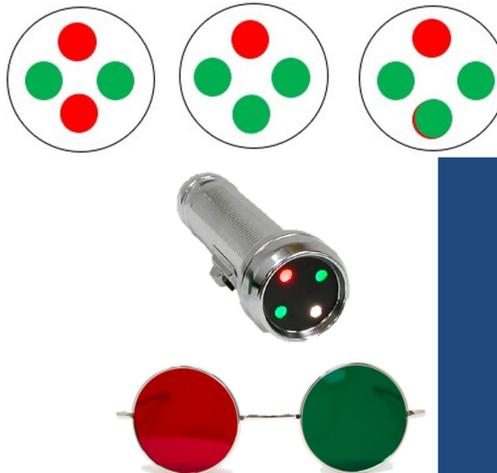
- One with a stereoscopic pattern representing a housefly
 - Fly: (Results saw in 3-D Y/N?)
- The other vectograms of the test provide finer tests for stereoscopic acuity
 - Circles (Keep guessing until miss 2 answers; Results: #/9)
 - Animals (Results: #/3)



Worth 4 Dot Test

The patient sees **four dots**.

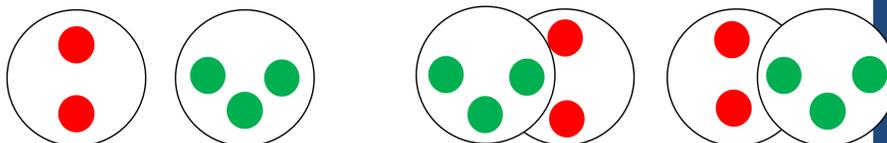
- **Normal binocular** response with no manifest deviation
- If the patient sees 2 red dots and 2 green dots, they are **right eye** dominant
- If the patient sees 1 red dot and 3 green dots, they are **left eye** dominant
- If the patient sees 1 red dot, 2 green dots, and the 4th dot fluctuates between red and green, there is **NOT** a strong dominance



Worth 4 Dot Test

What if the patient sees more or less than 4 Dots?

- The patient only sees two red dots: **Suppression of left eye.**
- The patient only sees three green dots: **Suppression of right eye.**
- The patient sees five dots: **There is binocular vision but a misalignment**
 - 2 red dots appear to the right of 3 green dots: **Esotropia**
 - 2 red dots appear to the left of the 3 green dots: **Exotropia**



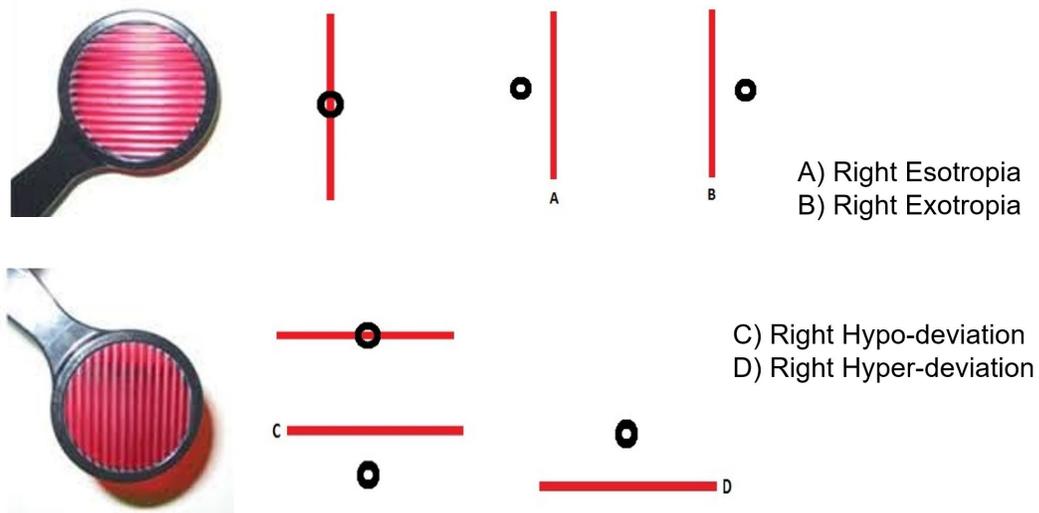
Maddox Rod

The **Maddox rod** test can be used to subjectively detect and measure a horizontal or vertical strabismus for near and distance.



Maddox Rod Results

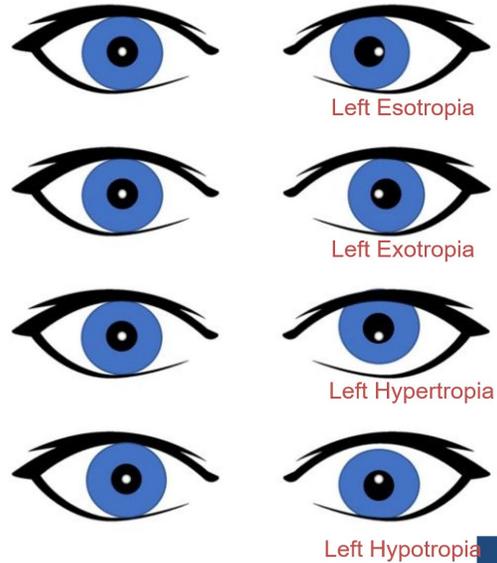
Red Lens over Right Eye



Hirschberg Test

Compare the Corneal Reflexes

- Detects presence or absence of strabismus by shining a light into the eyes then noting the position of the reflex of light
- Normal light reflex falls centrally on both corneas
- In a misaligned eye; the reflex will not be located on the central cornea

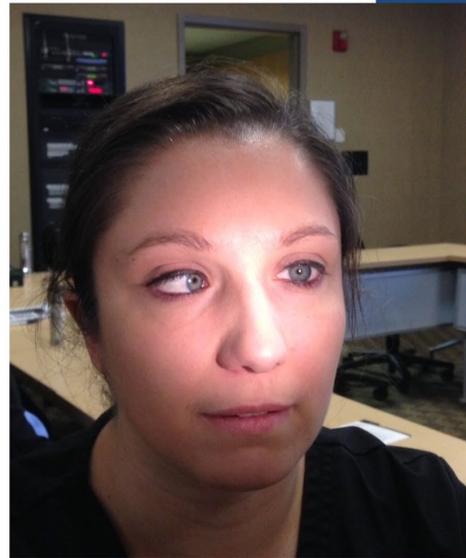


Hirschberg Test- Estimation of Prism Power Needed

Right Esotropia

For Reference, remember that:

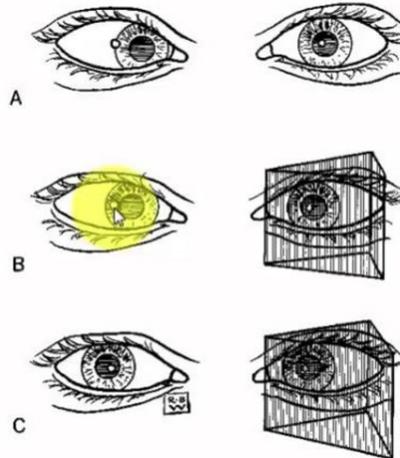
- 1mm = 15 Prism Diopters (Δ)
- Cornea about 12mm (average)
- Pupil in bright light: 3-5mm
- This example: Cornea reflex inside edge of iris, about 4 mm (from center) so about 60 Δ



Krimsky Test

- Like the Hirschberg Test, but introducing enough prism power to recenter corneal reflex and correct the ocular deviation

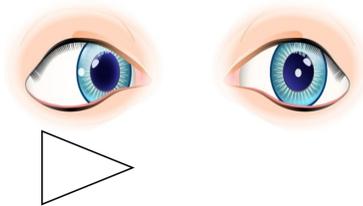
Add a little bit of prism-starting to correct misalignment



Add prism until fully corrected



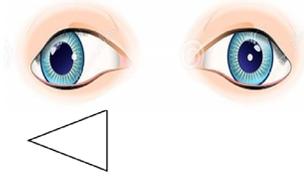
Base Out Prism



Apex of prism points toward the deviation. Forcing alignment towards the **base**.

- **Esotropia or Esophoria**

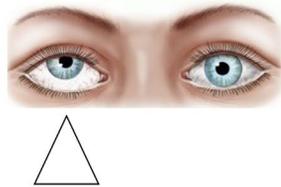
Base In Prism



Apex of prism points toward the deviation. Forcing alignment towards the **base**.

- **Exotropia or Exophoria**

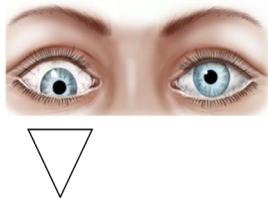
Base Down Prism



Apex of prism points toward the deviation. Forcing alignment towards the **base**.

- **Hypertropia or Hyperphoria**

Base Up Prism



Apex of prism points toward the deviation. Forcing alignment towards the **base**.

- **Hypotropia or Hypophoria**

Near Point of Convergence (NPC)

- This test measures the distance from your eyes to where both eyes can focus without double vision
- Record in mm (or to the nose)
- Normal = ≤ 7 mm



Near Point of Accommodation (NPA)

- This test measures the distance from your eyes to the near card where you can still be seen clearly
- Slowly move near vision card closer to the eye until the letters become blurry
- Measure the distance at which the letters became blurry

Other things to Know:

- Strabismus
- Suppression
- Underacting/Overacting muscles
- Nerve Palsy
- Nystagmus
- Sherrington's Law
- Hering's Law