



رقم المحاضرة ٣ + ٤

SYNOPTOPHORE

Convergence test

Heterophoria-1

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات البصريات

المرحلة الرابعة

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- **Define the Synoptophore.**

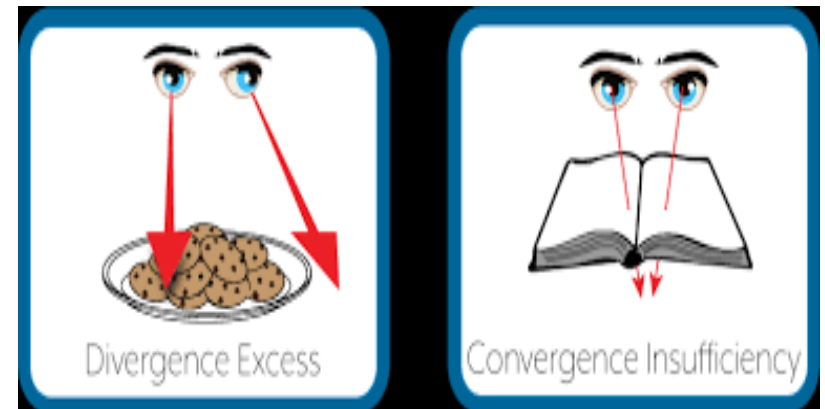
- An instrument used to assess and treat binocular vision disorders. Primarily used for diagnosing and treating strabismus, amblyopia, and other binocular vision issues.

What is Convergence?

- The inward movement of the eyes to focus on a near object.
- Essential for maintaining single vision when looking at close objects.

Importance of Convergence Testing.

- Detects **convergence insufficiency** or **divergent excess**.
- Critical in diagnosing conditions like convergence insufficiency (a common cause of eye strain, especially in children).

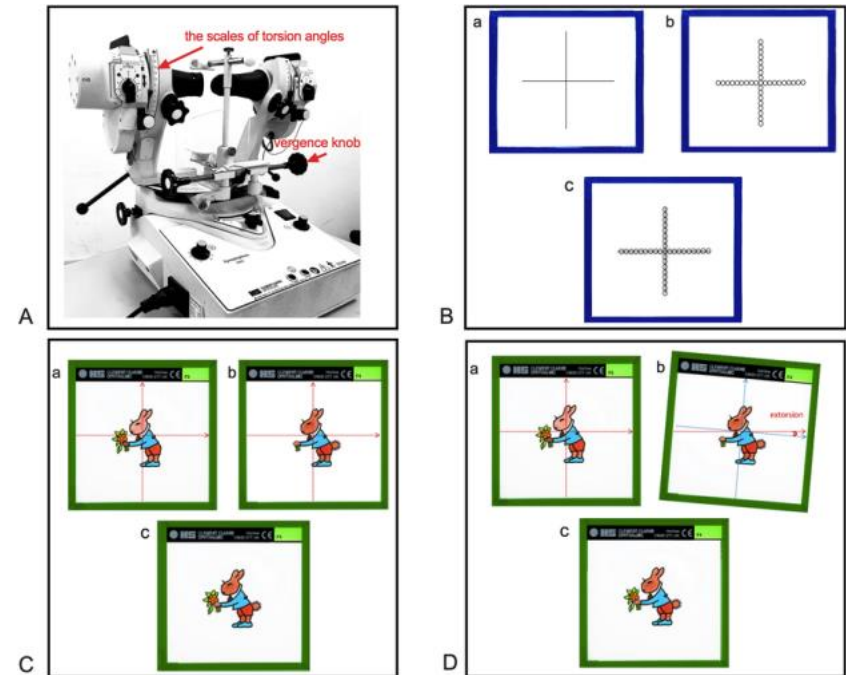


How the Synoptophore Works

- Basic principle: Presents different images to each eye (one to the left and one to the right).
- Allows assessment of eye alignment, fusion, and convergence.

Procedure: Convergence Test

1. The patient is seated in front of the Synoptophore.
2. Different test slides are presented to each eye.
3. The examiner instructs the patient to focus on a near object or a target slide.
4. The handles are adjusted to bring the eyes together for convergence.
5. Measurements are taken when the patient experiences fusion (single vision) or diplopia (double vision).



Convergence Range Measurement.

Positive fusional vergence (PFV) and near point of convergence (NPC).

Tools for adjusting the angle of convergence on the Synoptophore.

The normal NPC is about 6-10 centimeters . If the NPC is more than 10 centimeters, this is a sign of poor convergence

Assessing Fusion with Convergence

- Fusion happens when both eyes work together to create a single image.
- The examiner assesses whether the patient can maintain single vision while converging.

Examples of Clinical Conditions

- Conditions diagnosed with convergence testing on the Synoptophore:
 - 1- **Convergence insufficiency**: Difficulty focusing on near objects.
 - 2- **Exotropia**: Outward deviation of the eyes.
 - 3- **Accommodative insufficiency**: Related to focusing ability, etc.

Benefits of Using the Synoptophore

- Discuss the advantages:

1. Precise measurements of convergence.
2. Capability of testing at different distances and angles.
3. Valuable for diagnosing and managing strabismus and other binocular vision problems.

Limitations

1. Dependence on patient cooperation.
2. Might not be effective for very young children or non-cooperative patients.

Treatment of Convergence Insufficiency

- How the Synoptophore helps treat convergence problems:
 1. Vision therapy and exercises.
 2. Adjusting convergence through repeated exercises on the device.

Lecture 4

Heterophoria-1: definition, classification, Symptoms, evaluation

Define heterophoria: a latent misalignment of the eyes that only occurs when binocular vision is disrupted, such as when one eye is covered. Compare it briefly with heterotropia (strabismus)

Classification of Heterophoria

- **Exophoria:** Tendency of the eyes to drift outward.
- **Esophoria:** Tendency of the eyes to drift inward.
- **Hyperphoria:** Vertical misalignment, where one eye tends to move upward.
- **Hypophoria:** Vertical misalignment, where one eye tends to move downward.
- **Cyclophoria:** Rotational misalignment.
- Both esophoria and exophoria can be classified by the distance at which the angle is greater: respectively, convergence excess or weakness, divergence weakness or excess and mixed.

Classification Based on Magnitude

1. Mild heterophoria: Less than 5 prism diopters (PD).
2. Moderate heterophoria: Between 5–10 PD.
3. Severe heterophoria: More than 10 PD.

Symptoms of Heterophoria

1. Eyestrain, especially after prolonged near work.
2. Headaches or migraines.
3. Blurred or double vision (diplopia).
4. Difficulty focusing, especially when reading.
5. Fatigue or discomfort in the eyes.

Causes of Heterophoria

causes of heterophoria. These are **anatomical causes**, **refractive causes**, **uniocular activity** and **trauma**. Anatomical causes include an abnormal interpupillary distance(IPD).

Triggering Conditions

- Binocular vision is disrupted (e.g., closing one eye).
- Performing tasks requiring precise alignment (e.g., reading, close work).

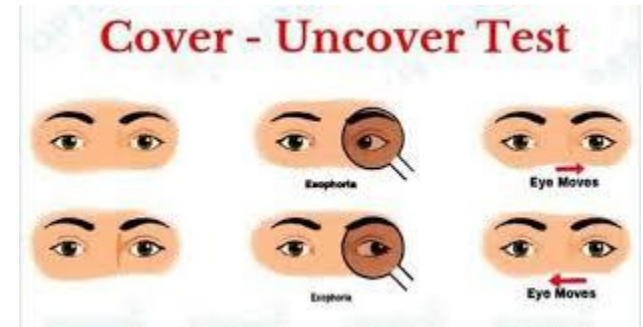
Factors Affecting Heterophoria

1. Fatigue, stress, illness.
2. Alcohol consumption.
3. Changes in prescription lenses.

Evaluation Methods of Heterophoria .

1- Cover Test

- the cover/uncover test: covering one eye and observing the movement of the other eye.
- Differentiate between cover/uncover and alternate cover test.



2- Maddox Rod Test

- the Maddox rod test for evaluating horizontal and vertical heterophoria.
- How the patient sees light streaks to assess alignment.

3- Prism Cover Test

- the prism cover test and its role in quantifying the degree of phoria.

4-Thorington Test

- the Thorington test, which is another common clinical test for assessing heterophoria using a card with numbers and a Maddox rod.

5-Synoptophore

- the use of Synoptophore for precise measurement of heterophoria and binocularity.

6- Von Graefe Test

Introduce the Von Graefe test using a phoropter to measure heterophoria.

Management of Heterophoria (treatment)

1. Eyeglass prescriptions with prism corrections.
2. Vision therapy exercises to strengthen binocular vision.
3. Rest breaks during visual tasks.

Condition	Modification to refractive correction
Basic esophoria (problematic esophoria at distance and near)	Maximum plus; bifocals may help at near
Divergence weakness esophoria (problematic esophoria at distance)	Maximum plus at distance
Convergence excess esophoria (problematic esophoria at near)	Bifocals or varifocals
Basic exophoria (problematic exophoria at distance and near)	Over-minus at distance and near
Divergence excess exophoria (problematic exophoria at distance)	Over-minus at distance, perhaps bifocals
Convergence weakness exophoria (problematic exophoria at near)	Upside-down executive bifocals

SUMMARY OF REFRACTIVE MODIFICATION AS A TREATMENT FOR DECOMPENSATED HETEROPHORIA