SAWA UNIVERSITY

ORHTOPTIC EXERCISE/2-3

ACTIVE AMBLYOPIA THERAPY IN CONVERGENCE EXCESS, CONVERGENCEINSUFFICIENCY ,DIVERGENCE EXCESS,HETEROPHORIA COMPUTER VISION THERAPY

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات البصريات

المرحلة الرابعة

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Active Amblyopia Therapy: Orthoptic Exercises

Orthoptic exercises for amblyopia are designed to enhance visual acuity, binocular vision, and overall visual function in individuals with amblyopia. These exercises are part of (active amblyopia therapy) and are typically tailored to the severity of amblyopia, the patient's age, and their visual demands.

Goals of Active Amblyopia Therapy

1. Improve visual acuity in the amblyopic eye.
2. Enhance coordination and alignment of both eyes.
3. Develop or restore binocular vision and stereopsis.
4. Strengthen the weaker eye by reducing suppression.

Key Orthoptic Exercises for Active Amblyopia Therapy

1. Occlusion Therapy (Patching):

- The dominant (better-seeing) eye is patched to force the use of the amblyopic eye.
- Duration depends on the severity of amblyopia and the patient's age.
- Often combined with vision exercises for maximum effect.

2. Penalization:

- A less invasive alternative to patching.
- Uses optical blur (e.g., atropine drops or special lenses) in the dominant eye to encourage the use of the amblyopic eye.

3. Near-Point Activities:

- Activities like reading, drawing, or solving puzzles while using the amblyopic eye.
- Helps improve fine visual skills and focus.

4. Pleoptics:

- Stimulating the amblyopic eye using specific light or visual targets to reactivate the retina's underused areas.

- Often done under the supervision of an orthoptist or eye care professional.

5. Anaglyph or Polaroid-based Exercises:

- Utilizes red-green or polarized glasses with visual stimuli designed to enhance coordination and fusion.

- Targets suppression and encourages binocular interaction.

6. Stereograms and 3D Vision Training:

- Helps improve depth perception and binocular function.

- Involves tasks like matching images or objects in three-dimensional space.

7. Computer-based Vision Therapy:

- Modern therapy programs (e.g., *RevitalVision*, *Luminopia*) use interactive games or virtual reality to stimulate the amblyopic eye and improve binocular vision.

- Encourages active participation and compliance.

8. Fusion and Vergence Training:

- Exercises like pencil push-ups or Brock string to improve convergence and divergence skills.

- Reduces suppression and enhances fusion reserves.

Complementary Approaches

1-Cycloplegic Drugs: Atropine drops blur the vision of the dominant eye.

2-Contact Lenses or Glasses: Prescribe appropriate refractive correction to address anisometropia or other refractive errors.

3-Surgical Interventions: Occasionally required for strabismus or other structural issues affecting vision.

Monitoring Progress

- Regular follow-ups are critical to evaluate visual acuity improvements, compliance, and the development of binocular function.

- Exercises are adjusted based on progress, ensuring a personalized therapy plan.

Lecture 9 Orthoptic exercises-3: in convergence excess, convergence insufficiency, divergence excess, heterophoria

Orthoptic exercises play a critical role in managing various binocular vision anomalies such as **convergence excess**, **convergence insufficiency**, **divergence excess**, and **heterophoria**.:

Convergence Excess (CE)

Definition: Excessive convergence at near distances compared to the demand.

Definition: Convergence excess is also a problem with ‘eye teaming.’ When a person has convergence excess and looks at a nearpoint target, their eyes converge to a point that is closer than where the target actually is. For example, if a book is held 16” away from the reader, the eyes may be pointing at a spot only 14” away.

Symptoms:

1. Eyestrain while reading.
2. Blurred or double vision at near.
3. Headaches during close work.

Orthoptic Exercises:

1. **Base-In Prism Flipper Training:**
   - Improves the ability to diverge.
   - Start with small prism diopters and increase gradually.
2. **Near Point of Convergence (NPC) Training:**
   - Encourage controlled convergence without overconverging.
3. **Anti-suppression Exercises:**

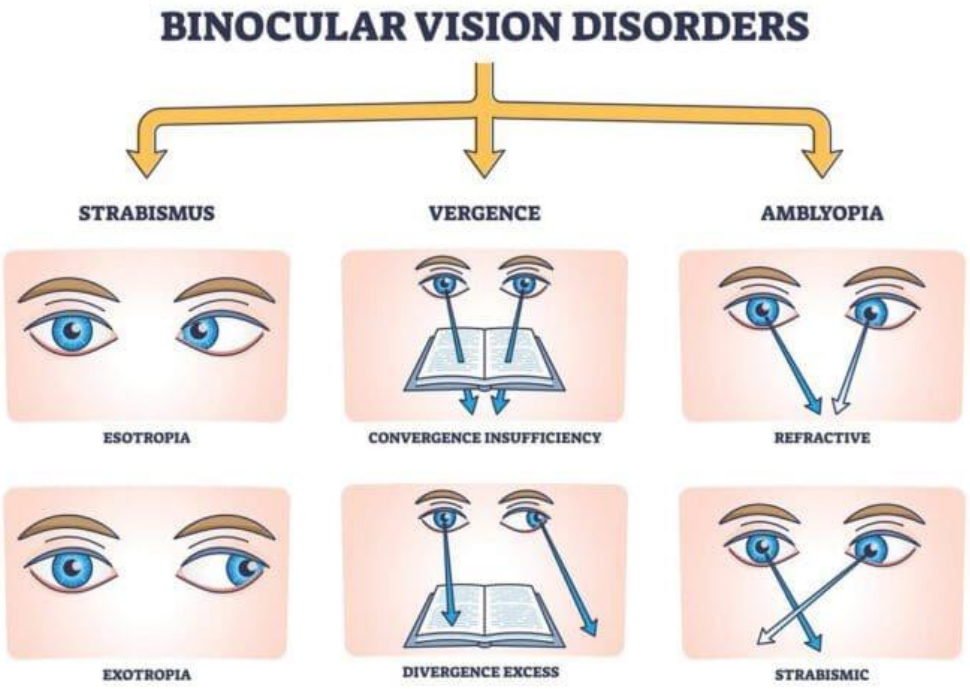
- Activities with red-green filters or polarized glasses to ensure both eyes are equally engaged.

Convergence Insufficiency (CI)

Definition: Reduced ability to converge when focusing on a near object.

Symptoms:

- Double vision or visual discomfort at near.
- Difficulty reading or concentrating.
- Fatigue or headaches with near work.

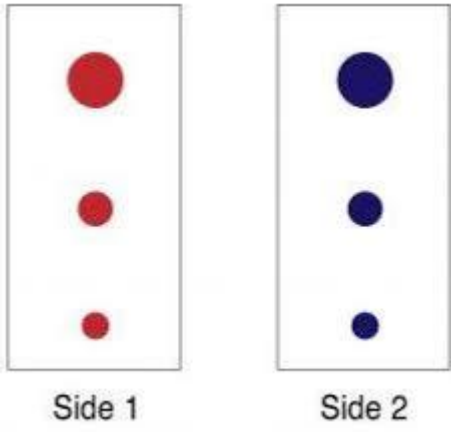


Orthoptic Exercises:

1. **Pencil Push-ups:**
   - Focus on a small target (like a pencil tip) while moving it closer to the nose, maintaining single vision.

- Focus on beads positioned at various distances along a string to practice convergence and fusion.

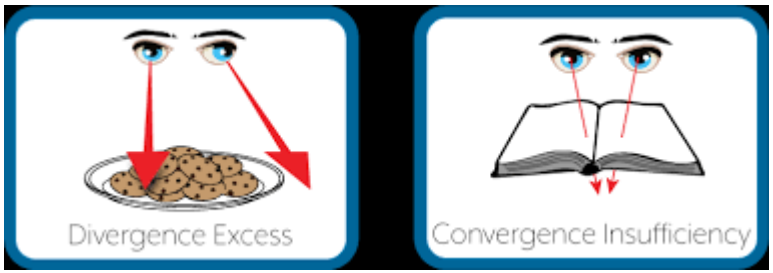
2. **Convergence Cards:**
   - Use cards with printed images to encourage convergence and depth perception.



3. **Computer-based Vision Therapy:**
   - Interactive tasks designed to improve convergence ability and fusion reserves.
4. **Jump Convergence Training:**
   - Alternate focusing between near and distant targets to improve flexibility.

Divergence Excess (DE)

Definition: Excessive divergence at far distances compared to the demand.



Symptoms:

- Eye turning outward (exotropia) at a distance.
- Blurred or double vision for distant objects.
- Difficulty maintaining binocular vision in far viewing.

Orthoptic Exercises:

1. **Base-In Prism Training for Near Tasks:**
    - Strengthens the ability to align eyes at a distance.
2. **Far Point Fusion Training:**
    - Use distant targets to practice controlled alignment and fusion.
3. **Dot Card and Fusion Games:**
    - Help reduce suppression and improve binocular function.
4. **Distance-to-Near Transitions:**
    - Train the ability to shift between far and near focusing smoothly.

Heterophoria

Definition: A latent misalignment of the eyes controlled by the fusion mechanism, classified as:

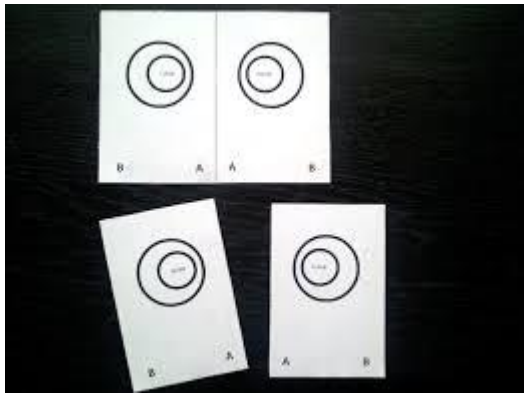
- **Exophoria:** Tendency of the eyes to diverge.
- **Esophoria:** Tendency of the eyes to converge.
- **Hyperphoria:** Vertical misalignment.
- **hypophoria:** Vertical misalignment

Symptoms:

- Eye strain or discomfort.
- Headaches or double vision.
- Difficulty maintaining focus.

Orthoptic Exercises:

1. **Fusional Vergence Training:**
    - Improve compensatory vergence ranges (e.g., Base-Out for exophoria, Base-In for esophoria).



2. **Stereograms or Fusion Cards:**
    - Engage both eyes to encourage proper alignment.
3. **Dynamic Vergence Tasks:**
    - Alternating tasks for both near and distance to strengthen the eye muscles and fusion reserves.

General Considerations:

- **Consistency:** Regular practice is essential for success.
- **Progressive Difficulty:** Gradually increase the challenge level of exercises.
- **Supportive Treatment:** May include prism glasses, refractive correction, or, in some cases, surgical intervention for severe cases

Thank you