
Orthoptic
treatment

WHAT IS ORTHOPTICS?

Orthoptics is from the Greek words-

Ortho-straight

Optikos-vision

Orthoptics is an ophthalmic field pertaining to the evaluation and treatment of patients with disorders of the visual system with an emphasis on binocular vision and eye movements

ROLE OF ORTHOPTICS

Evaluation & Diagnosis -

vision, BSV, ocular alignment and motility, accommodation and convergence anomalies and other associated disorders

Treatment-

Non surgical, mainly exercise

WHO NEED ORTHOPTIC EXERCISES?

- Convergence anomaly
- Accommodation anomaly
- Binocular instability
- Intermittent deviation
- Amblyopic patients who need therapy
- Post operative patients who needs better control to keep the eye straight
- Conditions causing double vision may be treated with eye exercises

WHEN TO CONSIDER EXERCISES?

- It is important to understand that it may not always be appropriate or possible to use orthoptic exercises to improve control of deviations

- In some circumstances, it may ultimately do harm in attempting orthoptic exercises in cases where surgery is required

- **As a general rule orthoptic exercises are considered in those with deviations measuring less than 15Δ**

PREREQUISITES OF ORTHOPTIC EXERCISES

Orthoptic exercises should only be considered

- Practitioner should have binocular vision potential
- Pathological cause for the strabismus must have been excluded
- Patient is in good health
- No underlying secondary cause, which requires medical or surgical management
- Motivation, Cooperation and good compliance

PURPOSE OF ORTHOPTIC EXERCISES

- Elimination of suppression
- Control of deviation
- Extension of the fusional amplitudes
- Improvement of relative (fusional) convergence
- Improvement of the near point of accommodation

WHAT WE CHECK IN ORTHOPTICS?

- Vision
- BSV (smp/ fusion/ stereopsis)
- Convergence
- Accommodation
- Suppression
- Deviation, if any

EVALUATION

- History
- Ocular and systemic examination
- Meticulous refraction preferably cycloplegic refraction

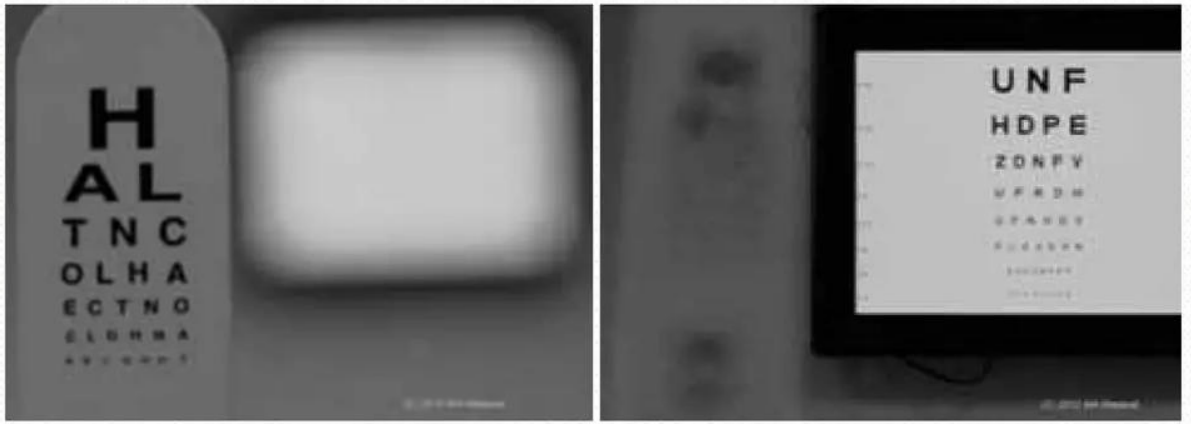
Before any oprthoptic exercises to be considered correct diagnosis and correction of refractive error is a must

TREATING CONVERGENCE INSUFFICIENCY

- The exercise or combination of exercises used depend on the extent of the convergence insufficiency
- **Little but often**
- Classically four to five minutes at a time and three times a day

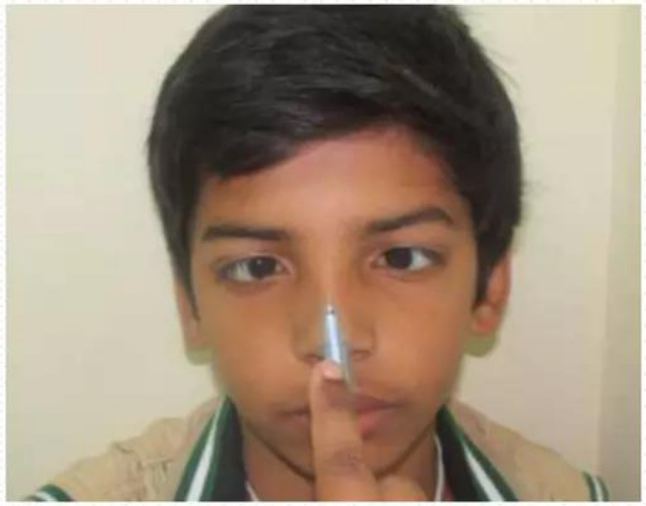
JUMP CONVERGENCE

- Two targets are required, one at near to be held by the patient and one at distance at least three meters away
- Looking from near target to distance target and again to near target
- At each distance the patient should maintain fixation with clear single vision for two to three seconds, and this should be repeated several times



PEN-TO-NOSE CONVERGENCE/PENCIL PUSH-UPS

- Holding the pen at arm's length and in a slightly depressed position focus on the tip of the pen
- Bring the pen slowly towards the nose whilst keeping one single pen at all times
- When the pen becomes two, move the pen back slightly to achieve one image again
- Repeat the exercise



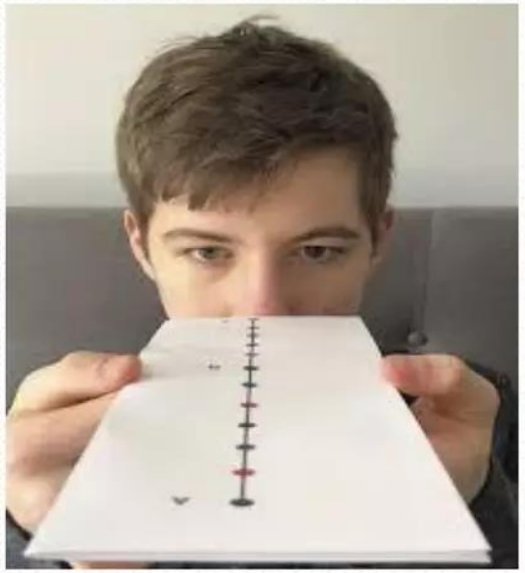
DOT CARD

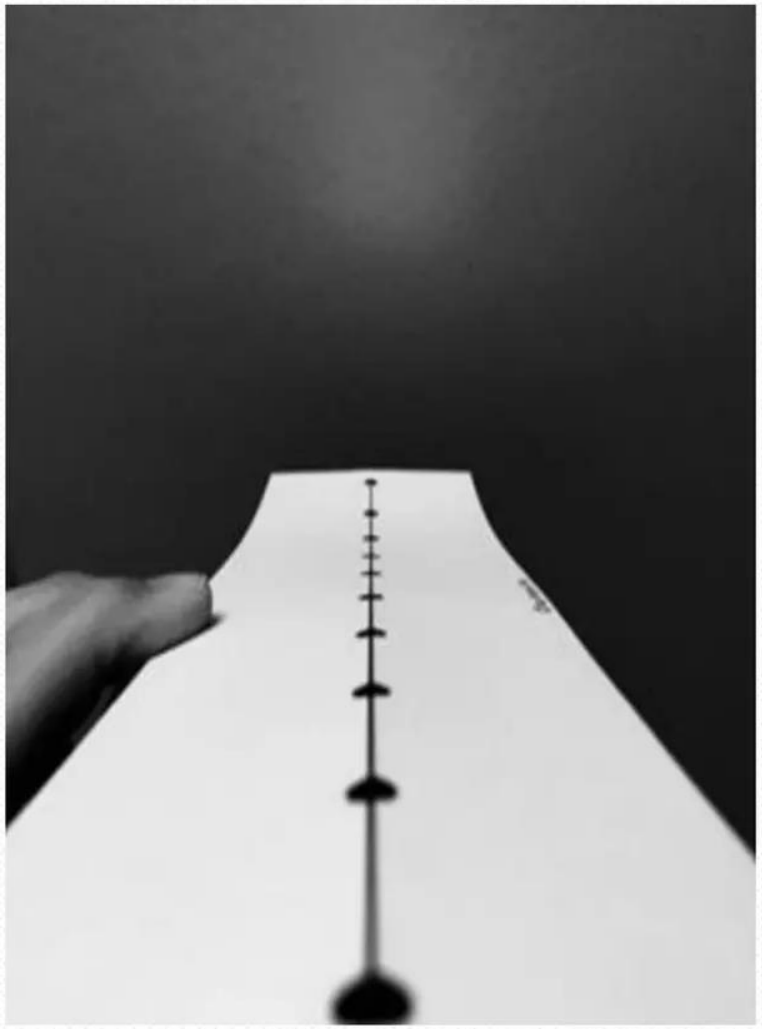
A series of small dots is equally spaced out along a line drawn on a card about 30 cm long

Method:

- The patient should fixate the furthest dot and should obtain crossed physiological diplopia of the line and the closer dots
- He then fixate each dot in turn proceding to the nearer one gradually fusing the images
- The more remote dots and line then appear as uncrossed diplopia
- The patient may also be asked to look at one dot and then into the distance and back again to exercise jump convergence

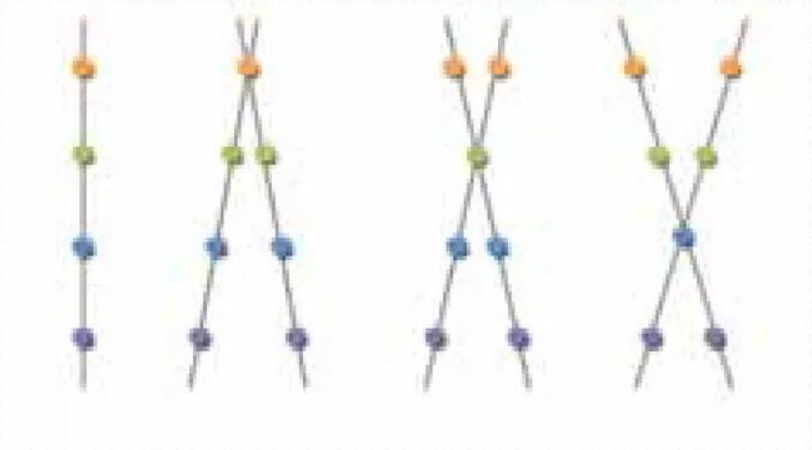
DOT CARD





BROCK STRING

- This is similar to the dot card exercise
- The patient will look at and jump between different colored beads on a string
- The patient begins by fixating on the furthest bead and then changes jump to the next bead along and continues in this manner until reach a bead where single vision cannot be maintained
- Physiological diplopia will again be perceived

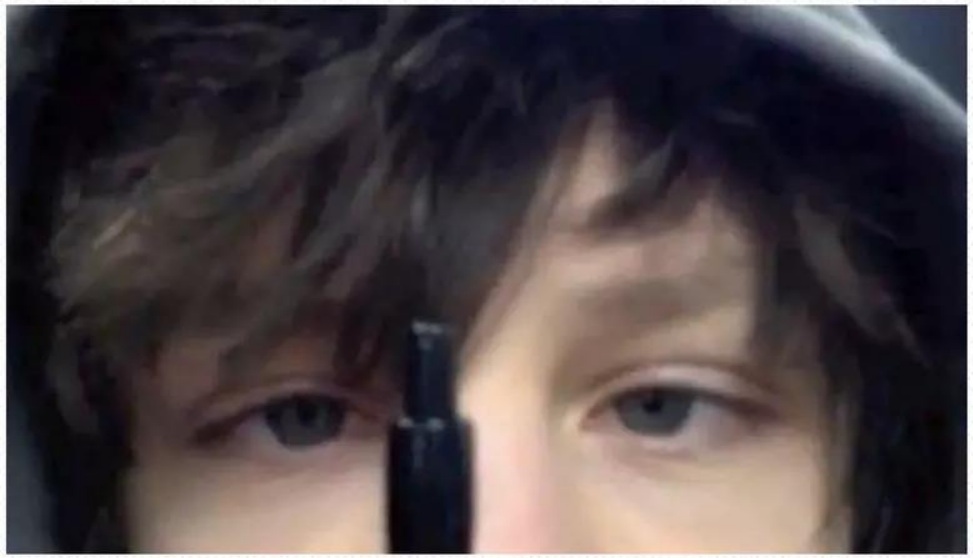


BROCK STRING

- Look at the 1st bead -V shape
- 2nd bead – X shape
- 3rd bead – A shape

TREATING ACCOMMODATIVE INSUFFICIENCY

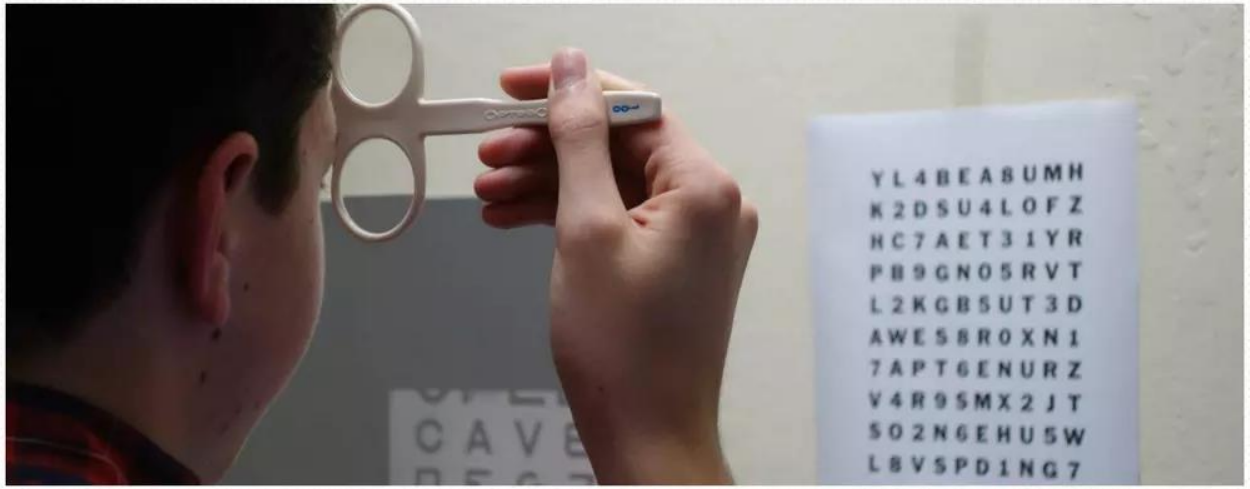
- **Jump accommodation -**Exercise is very similar to jump convergence
- **Accommodative push-ups -** similar to simple pen-to-nose convergence exercises



TREATING ACCOMMODATIVE INERTIA

Flipper lenses - Assessed using +2.00/-2.00

- Patient views a near target through positive lenses, maintaining clarity of the target, and then the lenses are flipped to the negative ones requiring the patient to maintain clarity of the target
- The number of repetitions/ flips which can be performed in one minute is assessed



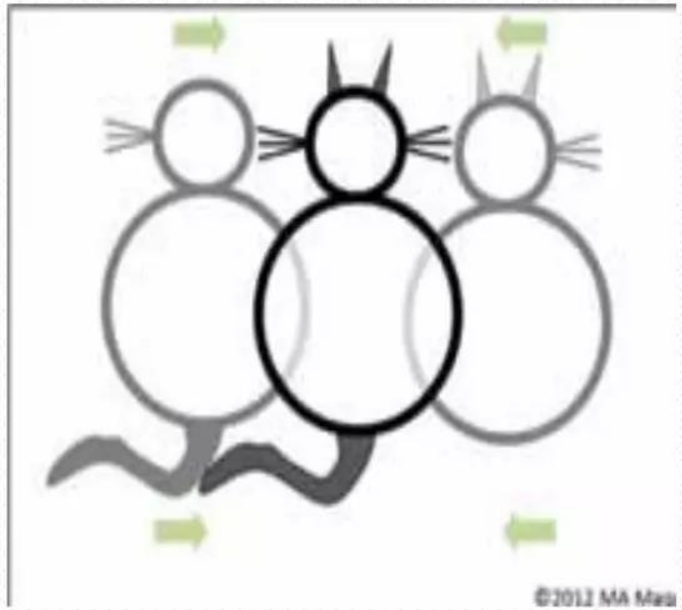
STEREOGRAMS

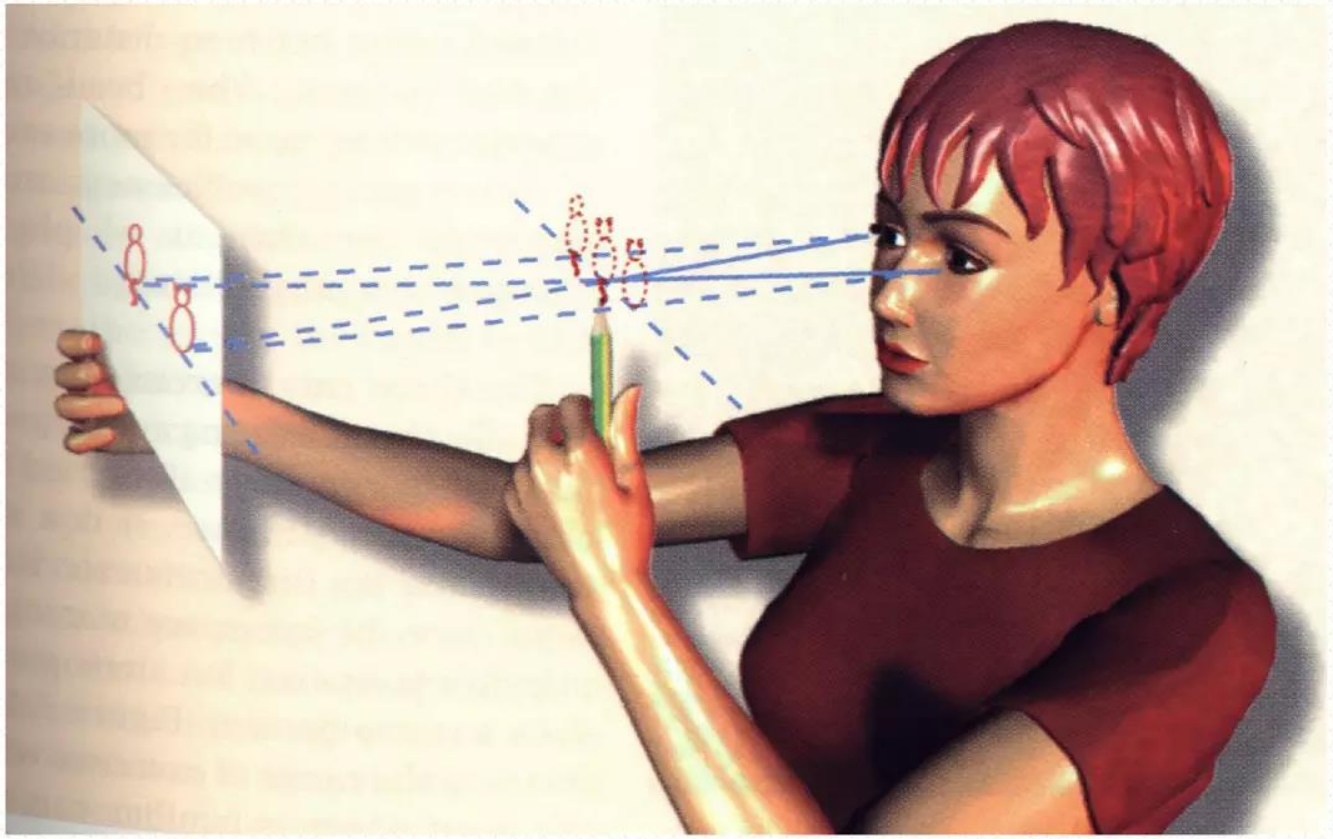
Mainly done to assess relative fusional vergence

- The card with the drawings of two incomplete cats are held at arm's length and the Patient fixates the pencil in between. The distance of the pencil is adjusted until the two middle cats fuse into a complete cat with two incomplete cats on either side.

- The Patient is asked to try and see the cats clearly

STEREOGRAMS





ORTHOPTIC INSTRUMENTS

1. Prism bar
2. RAF near point rule
3. Synoptophore
4. Cheiroscope
5. Brewster – holmes stereoscope
6. Vergence stereoscope
7. Remy’s separator
8. Diploscope
9. Image divider

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1.PRISM BAR

- Clinically fusional amplitudes may be improved by using a **prism bar**

- Positive fusional amplitudes - improved by practicing the **prism base out (exodeviation)**
- Negative fusion amplitude - improved by practicing the **prism base in (esodeviation)**

PRISM BAR (CONTD)

- Patient slowly increases the prism strength, while maintaining binocular single vision on a distance or near target. If fusion breaks (diplopia occurs), the patient is told try to regain single vision. If they are unable to do so, the prism strength is reduced until they are able to regain single vision
- This is repeated three to five times in order to exercise and increase the fusional amplitude

2.RAF NEAR POINT RULE (RNPR)

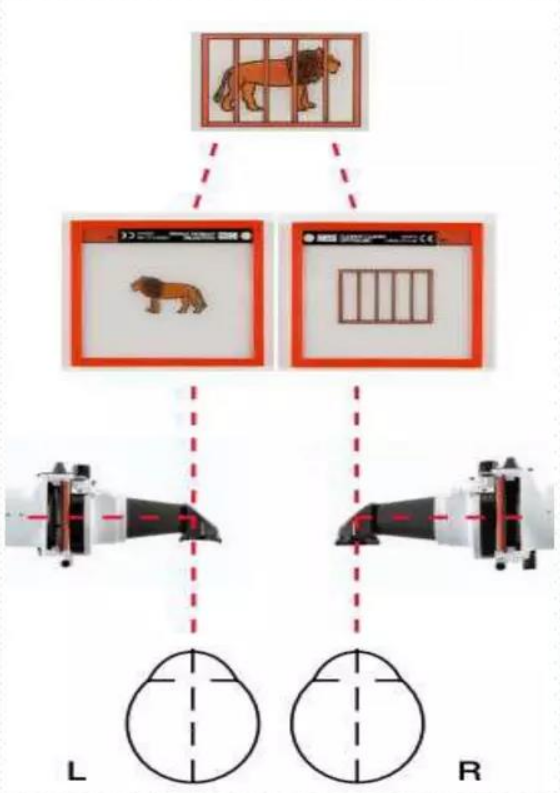
- RAF – Royal air force rule
- Measures near point of convergence (NPC) and near point of accommodation (NPA)
- Also used as a standard tool for research purpose and to provide therapeutic home-based orthoptic exercises

3.AMBLYOSCOPE/SYNOPTOPHORE

To assess subjective angle of deviation

To assess fusional range

Both **diagnostic and therapeutic** uses



AMBLYOSCOPE/SYNOPTOPHORE (Contd)

Diagnostic uses

- Angle of deviation
  - Subjective angle of deviation
  - Primary deviation
  - secondary deviation
  - vertical & cyclo-deviaition

- Status of binocular vision
- IPD measurement
- After image test for NRC & ARC

AMBLYOSCOPE/SYNOPTOPHORE(CONTD)

Therapeutic Exercise –

- Anti-suppression exercises
- Fusional vergence exercises
- Treatment of Abnormal retinal correspondence
- Amblyopia therapy

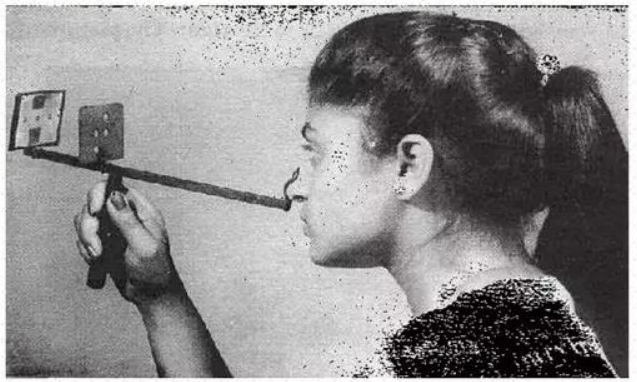
4.CHEIROSCOPE – Training of superposition

5.BREWSTER – HOLMES STEREOSCOPE - Allows training of fusion, its width and stereo vision

6.VERGENCE STEREOSCOPE - same way like Holmes stereoscope

7.REMY'S SEPARATOR - Mechanical instrument is used for relaxation of accommodation and convergence and for training their relationship

8.DIPLOSCOPE - This instrument is based on dissociation of real space. It is used for training of relationship between accommodation and convergence



9.READING WITH IMAGE DIVIDER - With this method is possible to fix fusion and train SBV

Thank You!