Optical instruments

Lecture 7

Orthoptic examination instruments,

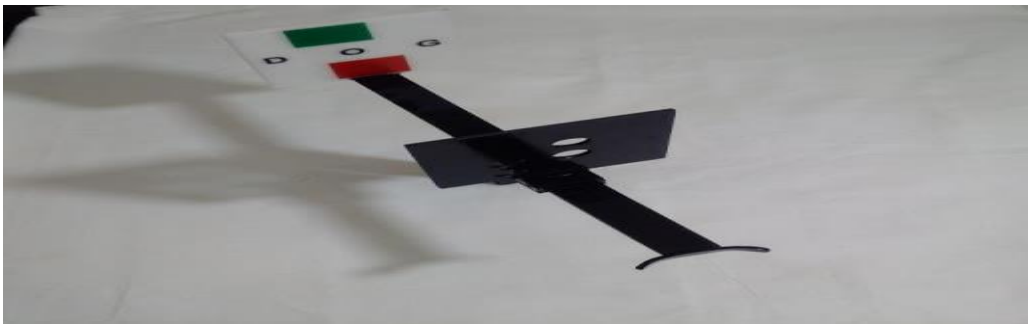
M.Sc Ali Hadi Alhussaini

Orthoptic examination instruments

1- DIPLOSCOPE :

Principle:

The septum associates the two eyes in such a way that each eye can see only two of the three letters in the white card and only one of the two coloured squares. The left eye sees the letter OG and the lower red square, while right eye sees the letter DO & upper green square



Structure:

➢Consist of metal shaft 25 cm long.

➢Small metal pad called "face piece" is located at one end & card holder at one end.

➢White card printed with D OG is placed in card holder.

➢Green square placed centrally above O and red square centrally lower.

➢Metal septum is placed parallel at 6.5cm from card.

➢ Four openings are provided in metal septum.

➢Two horizontal openings of 8mm diameter are at equidistance from center of shaft & are 15mm apart.

➢One of the vertical opening is lower the left side opening.

➢Other vertical opening is above the right side opening

Position 1:

➢Instructed to look through 2 central holes.

➢Letter D, O are visible to right and O,G to left.

➢If DOG is seen, shows eyes are in a normal position.

Position 2:

➢Instructed to look at point between two horizontal holes.

➢When the patient's eye meet in this point, the image of O no longer fall on both fovea, but on a retinal part nasal to the fovea in each eye.

➢Therefore, the O will seen in uncrossed diplopia & the patient sees DO & OG.

➢ When patient uses more total of convergence, patient will see only DG because D, O & G, O will overlap.

Position 3:

➢Instructed to look at object held half way between septum and his eye.

➢ When patient eye converges on this point, the image of D & O in the right eye & G & O in the left eye fall on a retinal origins nasal to fovea in each eye & so projected temporally, and the patient will see ODGO on the card.

Position4:

➢Instructed to look at a distance object and slightly above printed card.

➢Image seen by each are projected in crossed way.

➢Useful in convergent squint to teach in placing visual axis in divergent position.

➢In irregular divergent squint to keep 4 letters equidistant from each other.

- Positions 1, 2, 3 requires convergence of increasing total.
- Position 4 requires relative divergence relative to printed card.

Uses of Diploscope:

➢Suppression & the presence of lack of binocular vision can be detected.

➢The main use of the device is to use for virtual convergence, when binocular single vision is present.

CHERIOSCOPE:

Principle:

➢Patient hand supports the stimulus for overpowering hand.

➢Normal retinal correspondence is necessary

Structure:

➢Consists of working base.

➢Vertical picture mover on the side.

➢Two eyepieces of + 7.00 Ds are mounted on the stand at distance of + 14cm from base.

➢Oblique, tillable mirror is provided as a septum

Procedure:

➢The picture is placed in a picture mover & a sheet of paper on the base of the instrument.

➢The patient should look with his fixating eye into the mirror & with the overpowering eye on the paper.

➢Patient is instructed to suggestion the picture on the paper using a pencil.

➢Stable fixation of the picture should be stressed to stop fast change, which can be suspected, if the patient picture is smaller or larger than the picture or if the picture are missing.

Use

➢Heterophoria measurement.

➢Intermittent tropias.

READING BARS:

Reading bars are simple devices used to train the patient for subjectively controlling the keep of binocular vision.

Principle:

Based on the principle of physiological diplopia.

It includes:

- Thumb bar reader.
- Zig-zag bar reader.
- Mayan bar reader.
- Jaual grid.
- tibb 's physiologic diplopia reader.

Procedure:

➢Patient is made responsive of physiological diplopia by presenting bar between patient eye and reading physical.

➢As the patient read the print binocularly he sees the bar in crossed diplopia.

➢Each image of bar hiding on position of the print from one eye, but not the other, so that the print can be read normally.

➢Upkeep of correct position of the eye despites of the problems will support the binocular single vision.

➢ This is very useful & home use.

REMY SEPERATOR：

➢Consists of septum with a handle having a clear slide holder at one end and a nose piece at other end.

➢The patient resting on the septum is instructed to look through the slides at an object beyond them.

➢If the patient eye is focusing nicely by the retina of the both eye then we will see covered picture by the patient.

Use

relaxation of accommodation and convergence and for training their relationship.

STIBB'S BINOCULAR TRAINER

➢It is a haploscopic instrument.

➢It consist of a middle septum and two wing boards that folds together like a book.

➢Middle septum has mirror on both sides so that it can be used with either eye fixating.

➢Each wing board has vertical scale of 24 base up and base down & horizontal scale of 40 base in and base out.

➢There are four cards come with instrument and consist of peripheral, macular, and foveal superimposition and fusional picture

Procedure

➢Wing board is placed at an angle to the table.

➢The vertical wing board is to the right side when right eye is fixating and on the left side when left eye is fixating.

➢Patient places the bridge of the nose against the curved part of the septum so that the visual axis is vertical to the table.

➢Head should not be sloped.

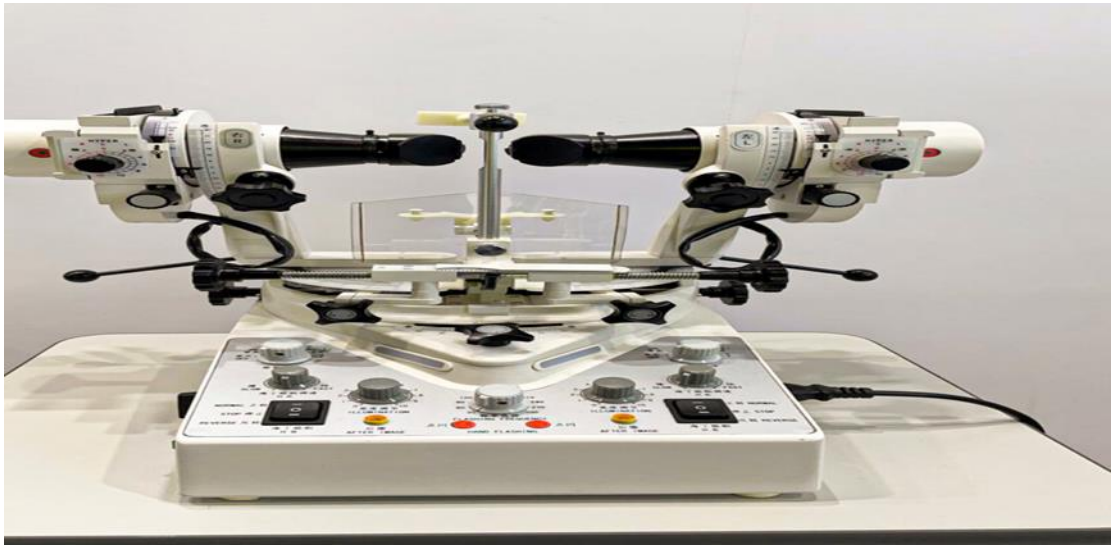
➢One target mover should placed in vertical wing board at the zero mark shows in the window This target seen in the mirror.

➢Another target is placed in the horizontal wing board and moves it until the two images are covered. This target is not viewed in the mirror

use

. It can be used for both diagnosis and treatment of suppression and abnormal retinal correspondence and for increasing fusional amplitude

SYNOPTOPHORES:



➢It is a haploscopic device.

➢Consist of two tubes, having a right-angled blend, mounted on a base having a chin rest and a forehead rest.

➢Each tube consist of a light source for illumination of a slide and a slide carrier at the outer end.

➢A reflecting mirror at a right angled bend.

➢Eyepiece of +6.5D at inner end.

➢The tubes can be converged and diverged and moved vertically separately or together by means of knob.

➢Each slide mover can be rotated to adjust for any torsion.

➢The horizontal, vertical and torsional positions of each tube with regard to normal zero position can be read on scales in either degree or prism diopters.

➢The graduation from zéro mark inward represents base out prism or degree of convergence.

➢From the zero mark outward represents base in prism or degree of divergence

Synoptophore slides:

1- Simultaneous perception slides:

a. Simultaneous foveal perception(SF).

b. Simultaneous macular perception (SMP).

C. Simultaneous paramacular perception (SPP).

Fusion slides.

Stereoscopic slides.

Uses of synoptophore

1-Diagnostic uses:

a)l Measurement of subjective and objective angle of deviation.

b) Measurement of primary and secondary deviation.

c) Measurement of IPD.

d) Assessment of grades of binocular vision.

e) Assessment presence & type of suppression.

f)Measurement of range of fusion or vergence.

g) Measurement of angle Kappa.

2-Therapeutic uses:

a)Suppression

c) Unusual fixation.

d) Accommodative esotropia.

f) Heterophorias and intermittent heterotropias.