

Author: Ida Lucy Iacobucci, 2015

License: Unless otherwise noted, this material is made available under the terms of the Creative Commons Attribution-NonCommercial-Share Alike 4.0 License: <http://creativecommons.org/licenses/by-nc-sa/4.0/>

The University of Michigan Open.Michigan initiative has reviewed this material in accordance with U.S. Copyright Law and has tried to maximize your ability to use, share, and adapt it. Copyright holders of content included in this material should contact open.michigan@umich.edu with any questions, corrections, or clarification regarding the use of content.

For more information about how to attribute these materials, please visit:

<http://open.umich.edu/education/about/terms-of-use>.

Chapter 10

CYCLODEVIATIONS

I. DEFINITIONS

- A. Cyclophoria - a latent torsional deviation in which the superior pole of the vertical meridian of the cornea of one eye tips nasally (incyclophoria) or temporally (excyclophoria).
- B. Cyclotropia - a manifest torsional strabismus in which the superior pole of the vertical corneal meridian of one eye tips nasally (incyclotropia) or the superior pole of the vertical corneal meridian tips temporally (excyclotropia) around the anterior-posterior axis when fusion is suspended.

NOTE: The prefixes *incyclo* and *excyclo* refer to the position of the superior pole of the vertical meridian of the cornea, *not the inclination of the image*.

II. CLASSIFICATION

- A. Cyclophoria - may be comitant or incomitant.
- B. Cyclotropia - may be constant or intermittent, comitant or incomitant.

III. ETIOLOGY

- A. Optical - resulting from uncorrected or recently corrected oblique astigmatism.
- B. Anatomical – abnormalities of insertion or check ligaments of the vertical muscles; paresis or overaction of the vertical muscles.
- C. Innervational abnormalities.

IV. SYMPTOMS

- A. Headaches.
- B. Nervous, upset, nausea, vomiting.

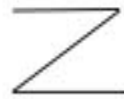
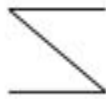
- C. Apparent distortion and/or tilting of objects.
- D. Near work may accentuate symptoms.
- E. Torsional diplopia (with cyclotropia).
- F. Head tilt - objective sign.

V. TESTS FOR DETERMINATION AND MEASUREMENT OF CYCLODEVIATION

A. Maddox double prism

1. Maddox double prism is placed horizontally in a trial frame is placed before the fixing eye while the patient's attention is directed to a horizontal line drawn on a card.
2. In the presence of a cycle-deviation a tipping of the middle horizontal line (seen by the non-fixing eye) will be seen between two parallel horizontal lines (seen by the fixing eye); tipping of the center line nasally indicates extorsion of the eye; tipping temporally indicates intorsion of the eye.

Example: Maddox double prism in front of O.D.



excyclodeviation O.S.
(image is incyclo-rotated)

incyclodeviation O.S.
(image is excyclo-rotated)

3. The amount of deviation present can be measured by the degree of rotation of the prism required to attain parallelism of the three lines.
4. Test with each eye fixing.

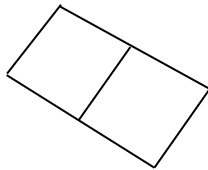
B. Double Maddox Rod

1. Two Maddox rods are placed in trial frame (one red, one white). The patient's attention is directed to a light source.
2. If fusion is present, must be suspended by introduction of appropriate prism to separate the two images.
3. In the presence of a cyclodeviation the rod before the eye which sees the tilted image is rotated until parallelism of the streaks is achieved and alignment with the floor. This is a measure of the torsion present.

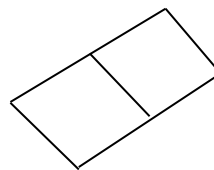
C. Major amblyoscope

1. Using grade one dissimilar targets, e.g., lion and cage, have patient fixate the lion. The slide presented to the non-fixing eye must contain a definite horizontal line. If the cage appears tilted, a cyclodeviation is present. The tilt of the image is in the opposite direction to the tilt of the eye.

Example: Tilting of image of the right eye



Incyclodeviation
(image O.D. is extorted)



excyclodeviation
(image O.D. is intorted)

2. To correct for incyclodeviation tilt the top of the slide carrier toward the patient until cage appears level. To correct for excyclodeviation tilt top of slide carrier away from the patient. The amount of deviation is read from the scale on the slide carrier arm.
 3. Repeat procedure fixing the other eye.
- D. Lancaster red-green test - Cyclodeviations may be diagnosed by this test but not quantitatively measured.

VI. TREATMENT

- A. Correction of refractive error.
- B. Correction of any associated vertical deviation (in phoria cases the effort to overcome the hyperphoria may accentuate the cyclophoria).
- C. In an attempt to increase torsional fusional amplitudes, the cyclodeviation may be gradually increased in the opposite direction on the major synoptophore while the patient maintains fusion on the targets presented.
- D. Surgical management if torsion is greater than 5 degrees with Double Maddox.