

# Consensus Statement on Guidelines for the Interpretation of Automated Visual Fields

---

# Abbreviations

ONTT = Optic Neuritis Treatment Trial

OHTS = Ocular Hypertension Treatments Study

IIHTT = Idiopathic Intracranial Hypertension Treatment Trial

# Methods

The consensus statement was developed using a modified Delphi approach in which 80% agreement was considered to indicate a consensus.

This consensus statement is largely based on the published guidelines in the ONTT, OHTS and IIHTT studies. It has been developed with the collaboration of Chris Johnson.

The pictures of visual field defects are those published in the ONTT with the exception of those for the pericentral, and cloverleaf defects which are original depictions.

# Criteria for “Abnormal” and “Suspicious”

In order for anomalous points to be regarded as abnormal, there should be clinical correlation (e.g. corresponding defects on funduscopy or OCT) or the anomaly should be reproducible.

In the absence of clinical correlation or reproducibility, an abnormality may be deemed ‘suspicious’ if it meets the following criteria: 1) a cluster of at least three abnormal points, 2) two adjacent abnormal points where at least one has a p-value worse than the 1% level, 3) a single abnormal point with a p-value that is worse than 0.5%.

# Total or Pattern Deviation Plot

“In general, the pattern of abnormal points on the deviation plot (total or pattern) showing the greater number of abnormal points should be used to determine the appropriate classification for an abnormality. However, the other deviation plot as well as the gray scale should be evaluated to confirm the appropriateness of the classification.”

(quoted from the guidelines of the ONTT, OHTS, and IIHTT)

# Scotoma

A focal abnormality that is completely surrounded by a zone of preserved sensitivity.

# 24 Abnormalities (6 Groups)

## Neurologic

1. Hemianopia
2. Partial Hemianopia
3. Quadrantanopia
4. Vertical Step
5. Three Quadrants
6. Enlarged Blind Spot

(If the cause of the enlarged blind spot is peripapillary atrophy, then the abnormality should not be regarded as a neurologic defect)

## Diffuse

16. Multiple Foci
17. Widespread / Generalized depression
18. Total Loss

## Nerve Fiber Bundle

7. Altitudinal
8. Arcuate
9. Partial Arcuate
10. Nasal Step
11. Pericentral
12. Temporal Wedge

## Artifactual/Retinal

19. Superior Depression
20. Inferior Depression
21. Partial Peripheral Rim
22. Peripheral Rim
23. Cloverleaf

## Central

13. Central
14. Centrocecal
15. Paracentral

## Nonspecific

24. Nonspecific

[\(back to table of contents\)](#)

# Neurologic Abnormalities

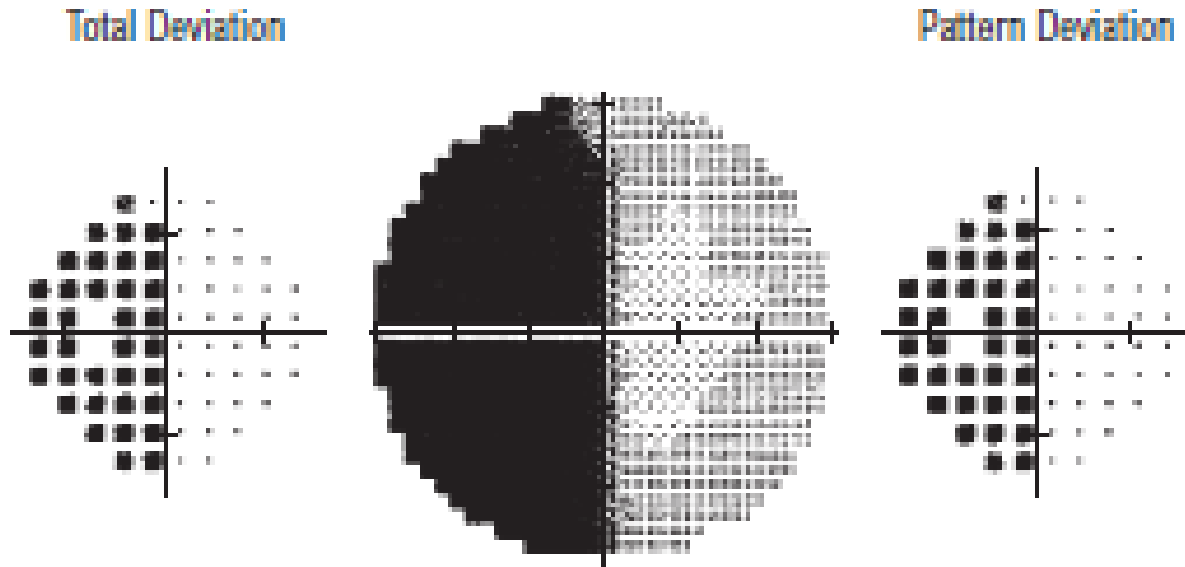
---

- [Hemianopsia](#)
- [Partial Hemianopsia](#)
- [Quadrantanopia](#)
- [Vertical Step](#)
- [Three Quadrants](#)
- [Enlarged Blind Spot](#)\*

\*If the cause of the enlarged blind spot is peripapillary atrophy, then the abnormality should not be regarded as a neurologic defect



# Hemianopia

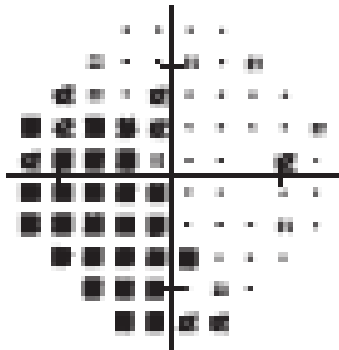


“A visual field defect that respects the vertical meridian and that involves essentially all points in a vertical hemifield”

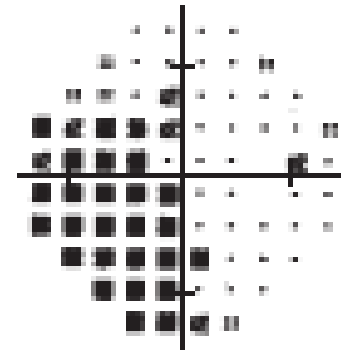
(quoted from the guidelines of the ONTT, OHTS)

# Partial Hemianopia

Total Deviation



Pattern Deviation

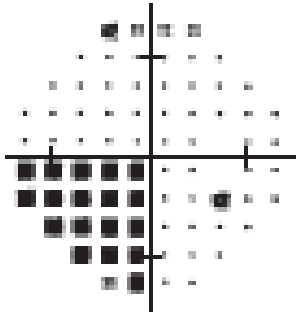


“A visual field defect that respects the vertical meridian and that is greater than 1 quadrant but less than a complete vertical hemifield.”

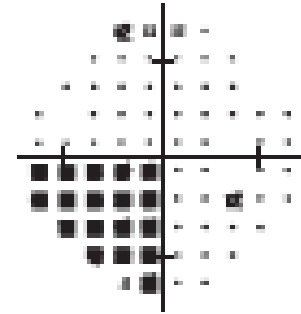
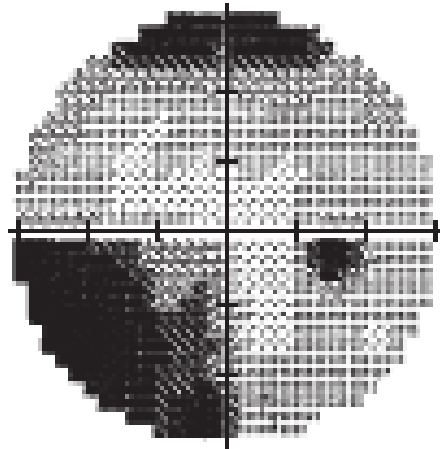
(quoted from the guidelines of the ONTT, OHTS)

# Quadrantanopia

Total Deviation



Pattern Deviation

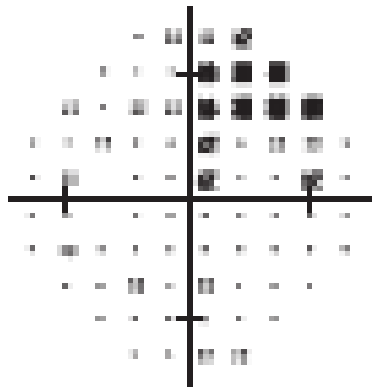


“Significant visual field loss throughout an entire quadrant that respects the vertical midline. Essentially all points must have a  $P < 5\%$  value on the total deviation plot.”

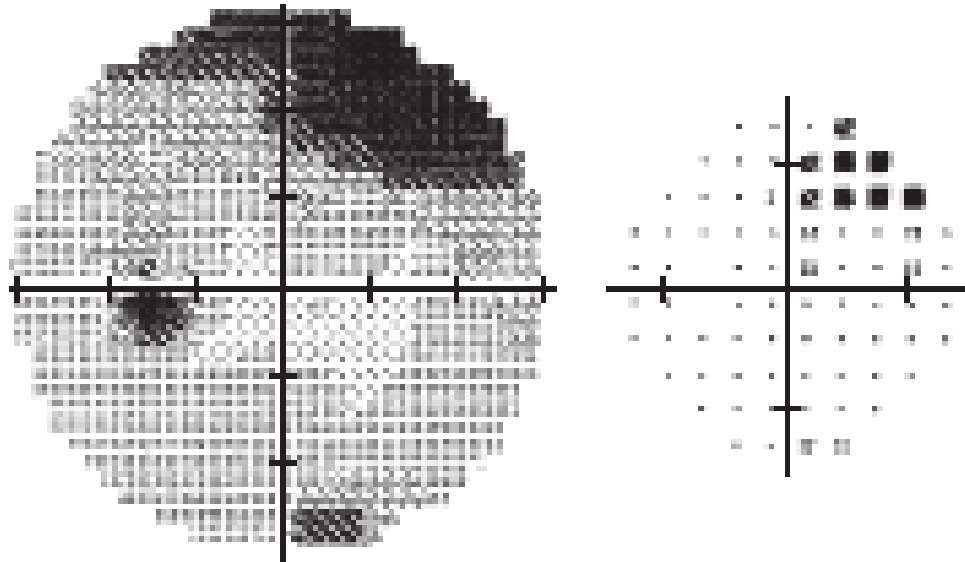
(quoted from the guidelines of the ONTT, OHTS, and IIHTT)

# Vertical Step

Total Deviation



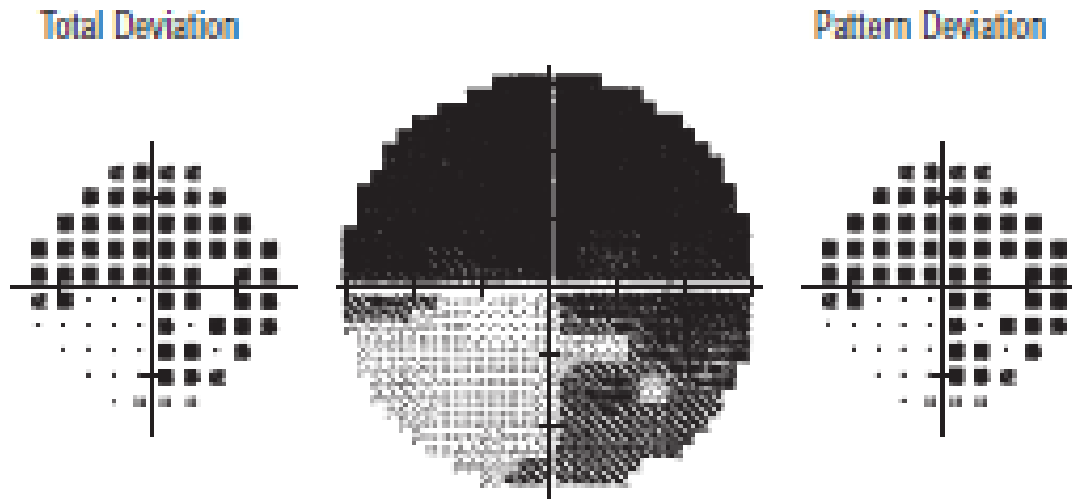
Pattern Deviation



“Limited visual field loss that respects the vertical meridian and that includes at least 2 abnormal points at or outside 15° along the vertical meridian.”

(quoted from the guidelines of the ONTT, OHTS, and IIHTT)

# Three Quadrants

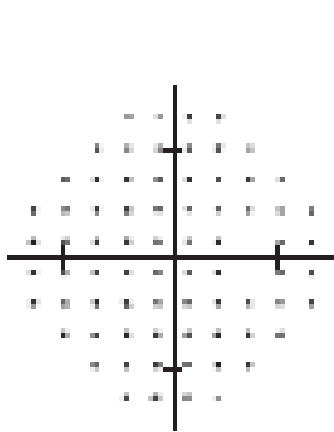


“Significant visual field loss throughout 3 quadrants; essentially all points must have a  $P < 5\%$  value on the total deviation plot.”

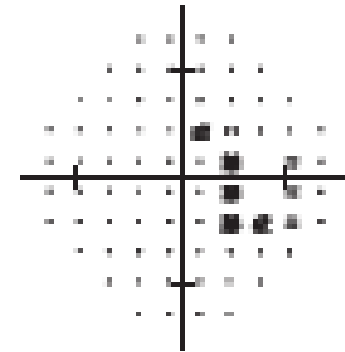
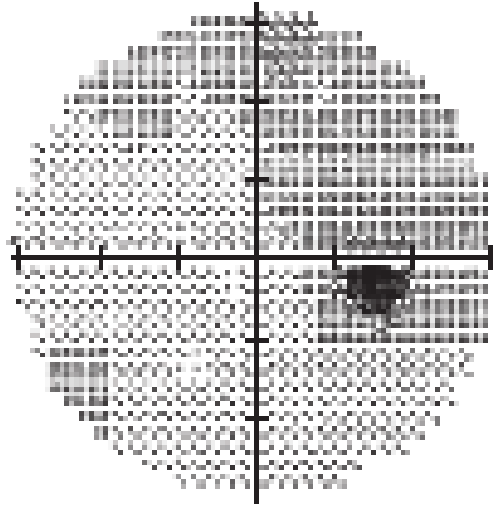
(quoted from the guidelines of the ONTT, OHTS, and IIHTT)

# Enlarged Blind Spot

Total Deviation



Pattern Deviation



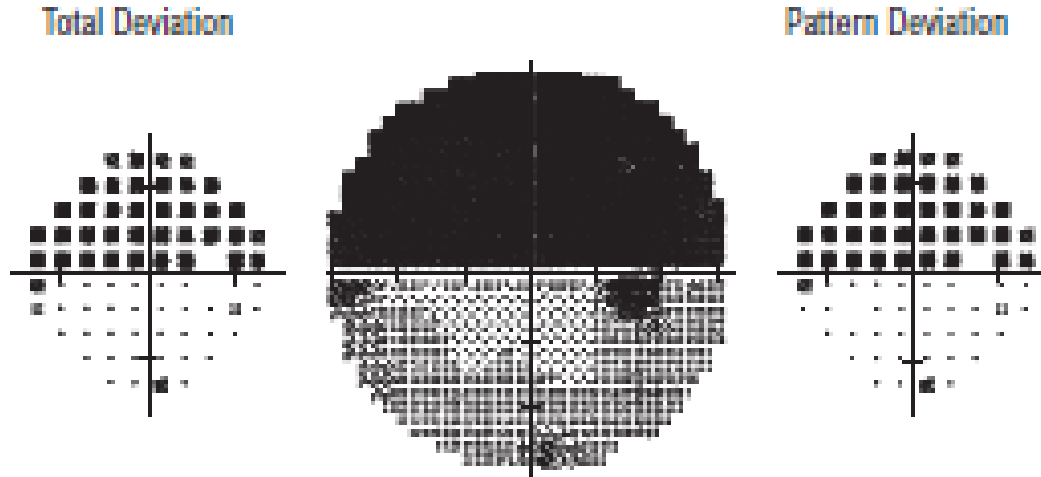
“A visual field abnormality in the nerve fiber bundle region that involves at least 2 points and is contiguous with the blind spot”

(quoted from the guidelines of the ONTT)

# Nerve Fiber Bundle Abnormalities

- [Altitudinal](#)
- [Arcuate](#)
- [Partial Arcuate](#)
- [Nasal Step](#)
- [Pericentral](#)
- [Temporal Wedge](#)

# Altitudinal

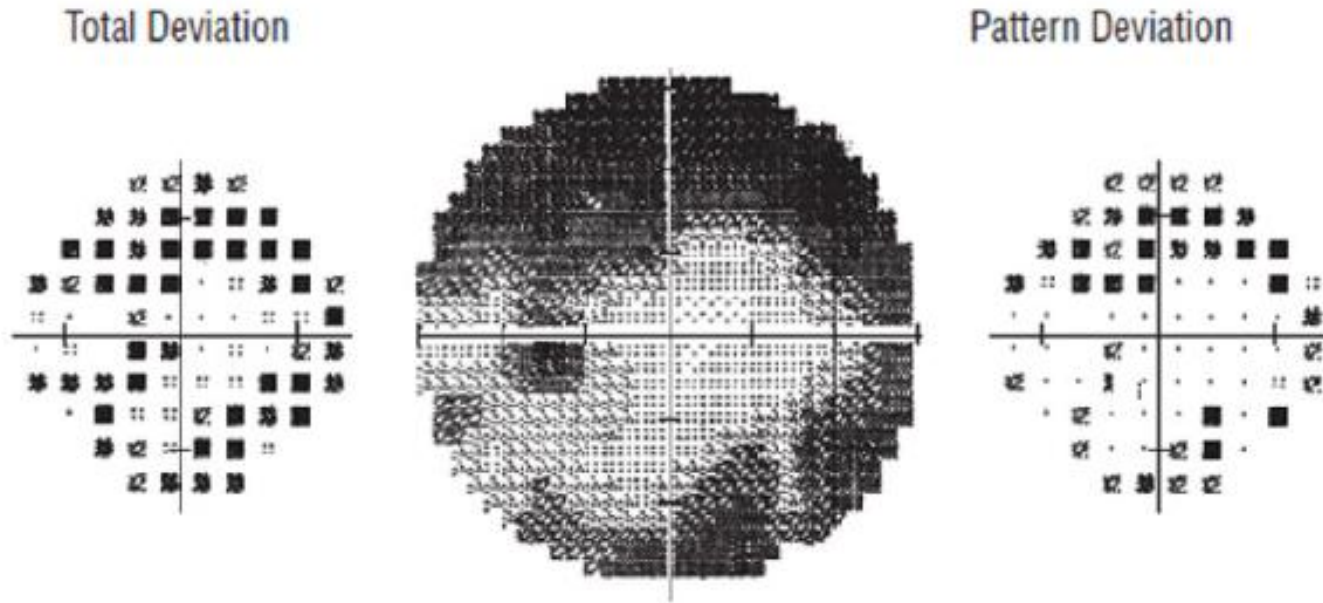


“Severe visual field loss throughout the entire superior or inferior hemifield that respects the horizontal midline, with the majority of the points in the hemifield having a  $P < 5\%$  value on the total deviation plot and the entire horizontal midline demonstrating abnormality.”

(quoted from the guidelines of the ONTT, OHTS)



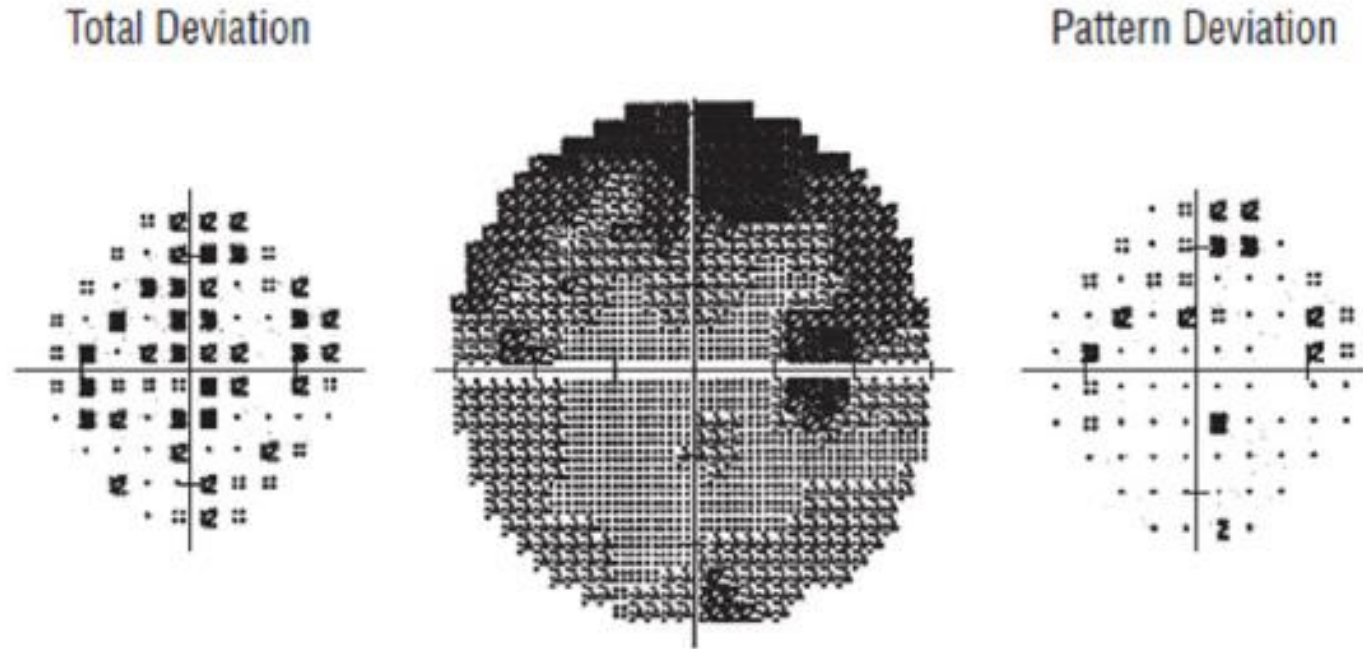
# Arcuate



“Significant visual field loss in the nerve fiber bundle region, extending across contiguous abnormal points from the blind spot to at least 1 point outside 15° adjacent to the nasal meridian”

(quoted from the guidelines of the ONTT, OHTS, and IIHTT)

# Partial Arcuate



“Visual field loss in the nerve fiber bundle region that extends incompletely from the blind spot to the nasal meridian. The defect is generally contiguous with either the blind spot or the nasal meridian and must include at least 1 abnormal location in the temporal visual field.”

(quoted from the guidelines of the ONTT, OHTS, and IIHTT)

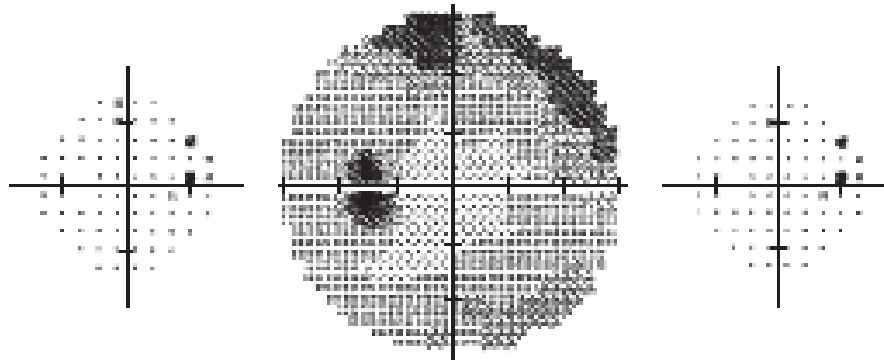
[\(back to full list\)](#)

# Nasal Step

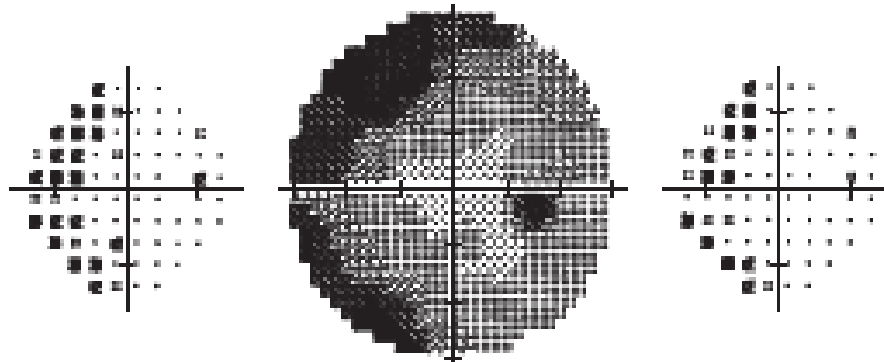
Total Deviation

Pattern Deviation

Mild nasal step

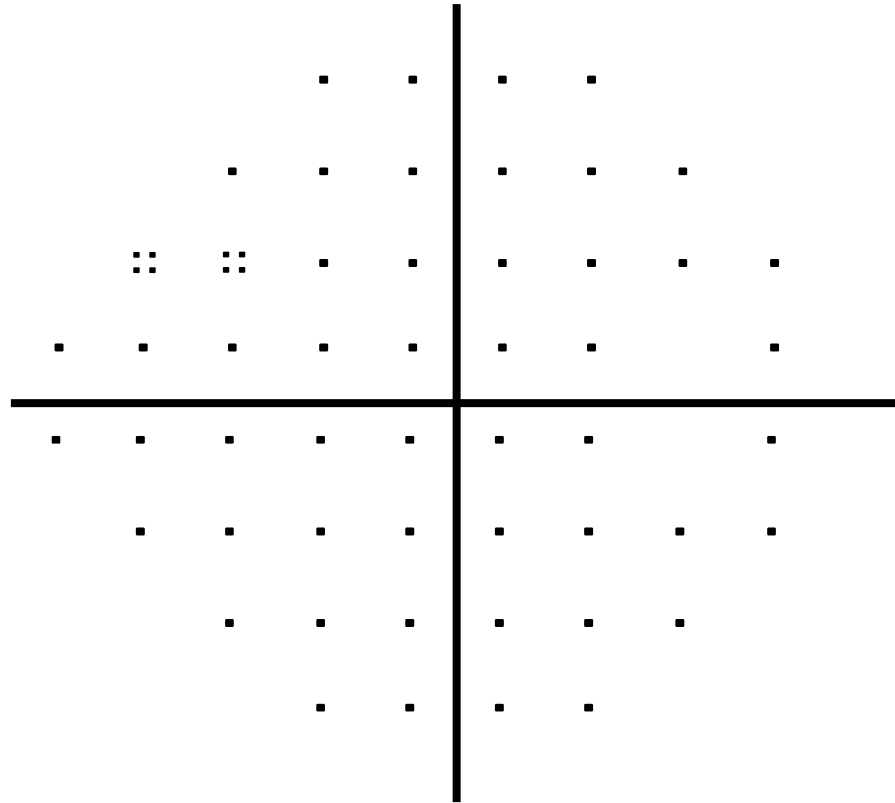


Severe nasal step



“Limited field loss adjacent to the nasal horizontal meridian with at least 1 abnormal point at or outside 15° on the meridian. Cannot include more than 1 significant point (on either plot) in the nerve fiber bundle region on the temporal side.”

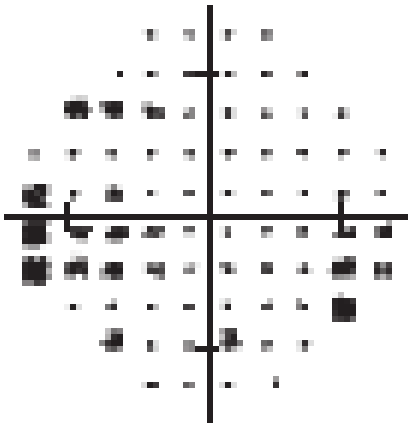
# Pericentral



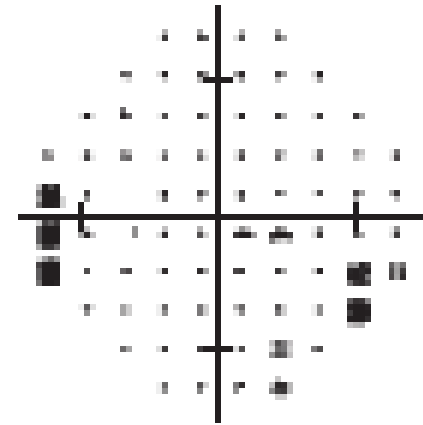
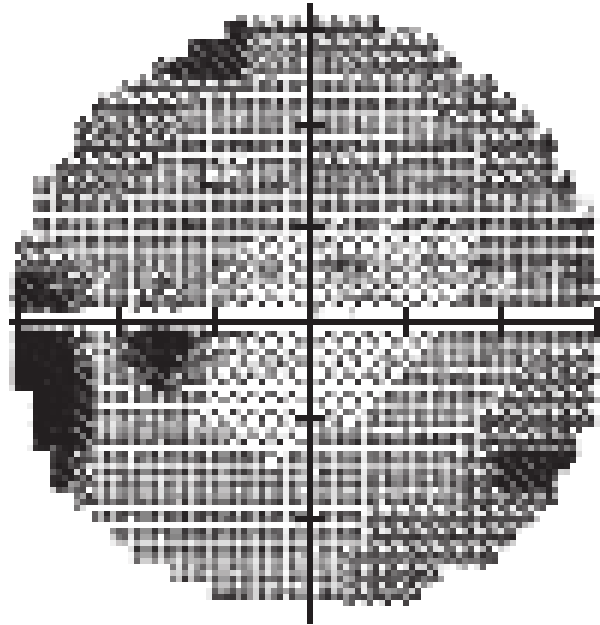
“A relatively small visual field abnormality (2 or more adjacent locations that are outside normal limits) that is outside the papillomacular bundle region and beyond the 9 degrees of fixation, where one or more points are within this region and appear on both the Total and Pattern Deviation Probability plots.”

# Temporal Wedge

Total Deviation



Pattern Deviation



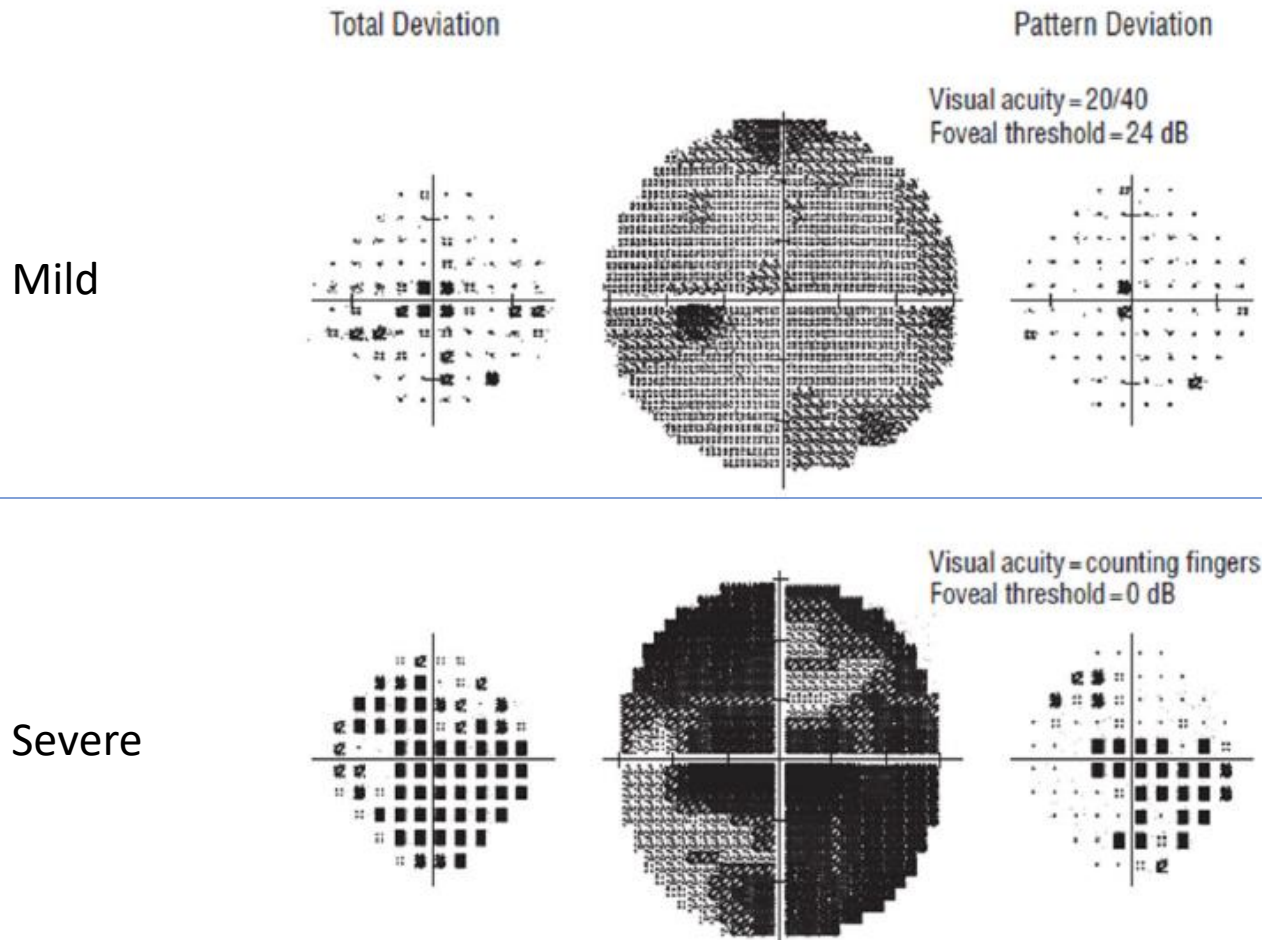
“A small visual field defect that is temporal to the blind spot”

(quoted from the guidelines of the ONTT and OHTS)

# Central Abnormalities

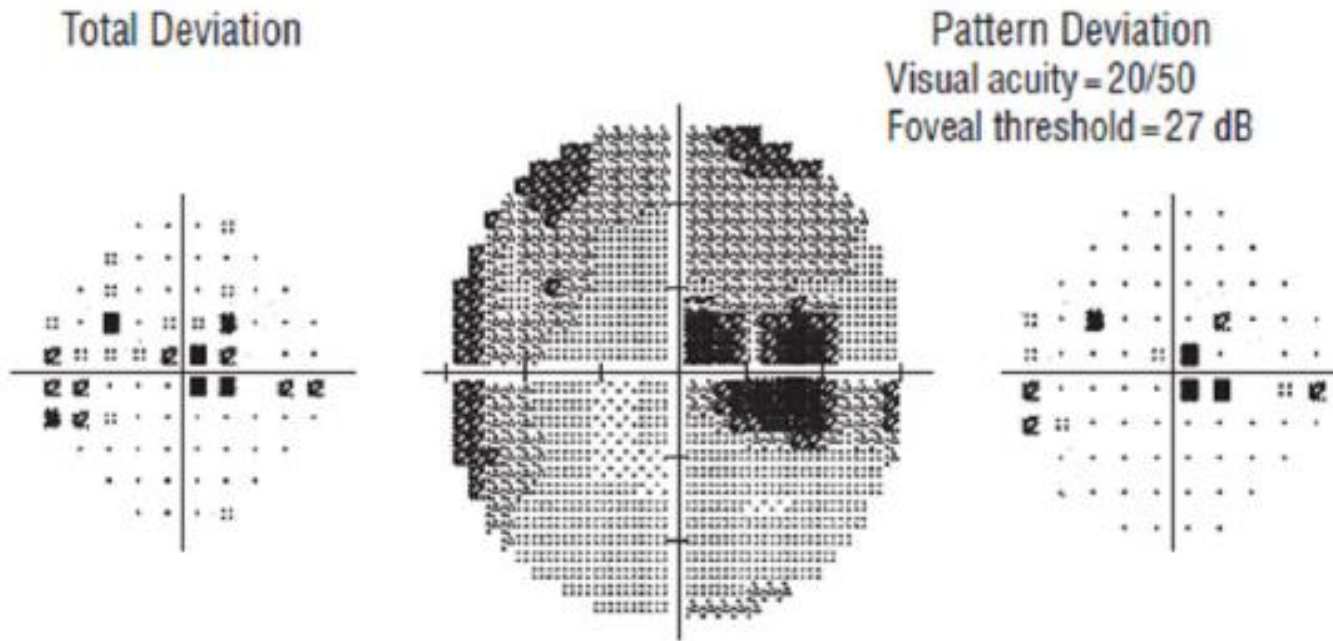
- [Central Scotoma](#)
- [Centrocecal Scotoma](#)
- [Paracentral Scotoma](#)

# Central Scotoma



“Visual field loss that is predominantly in the macular region. The foveal threshold must have a  $p < 5\%$  value. Can be associated with a single hemifield and paired with another defect.”

# Centrocecal Scotoma

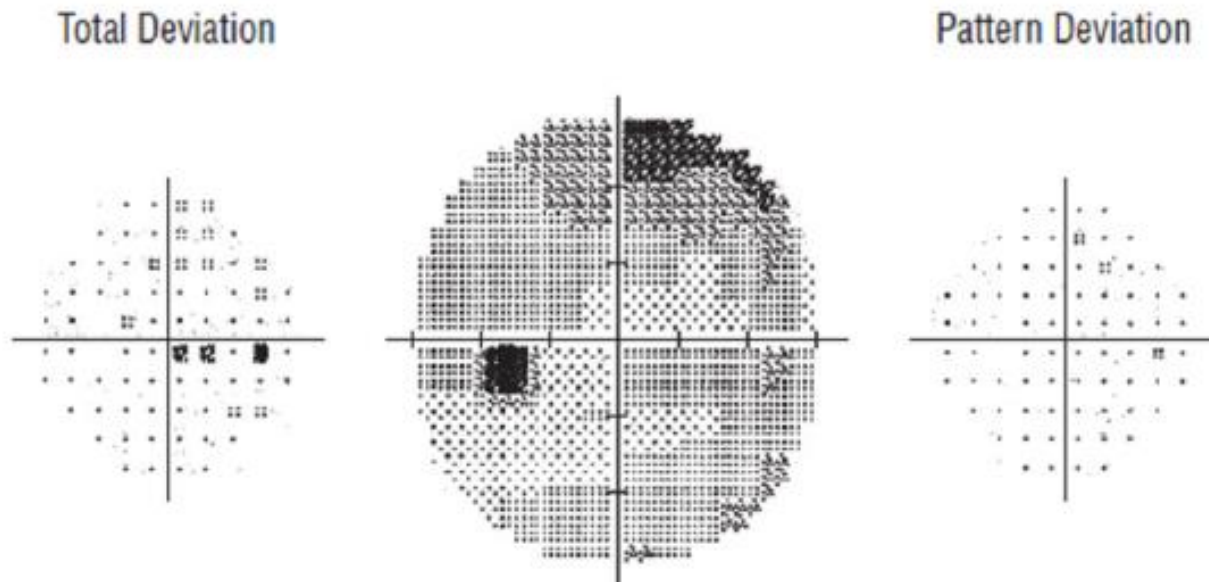


“Visual field loss that is in the macular region and contiguous with the blind spot. The foveal threshold must have a  $P < 5\%$  value. The loss must be symmetrical above and below the midline.”

(quoted from the guidelines of the ONTT)



# Paracentral Scotoma

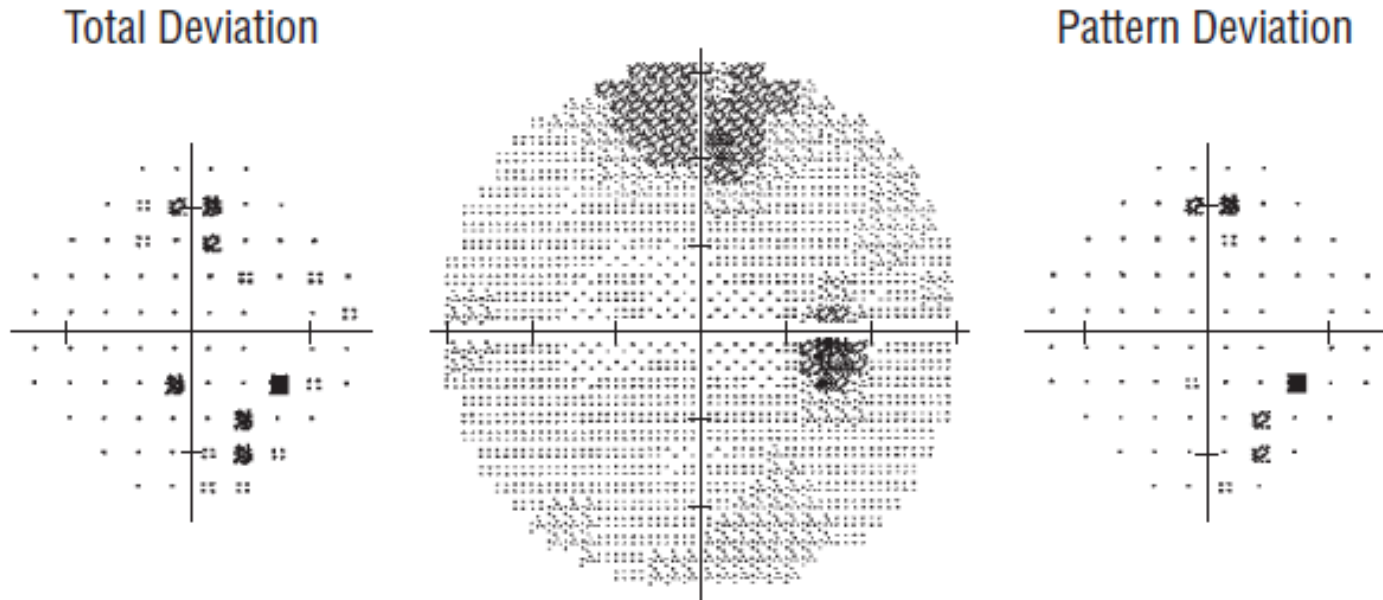


“A relatively small visual field abnormality that is within 9 degrees of fixation, where one or more points are within this region and appear on both the Total and Pattern Deviation Probability plots and is generally not contiguous with the blind spot or the nasal meridian. In particular, it does not involve points outside 15 degrees that are adjacent to the nasal meridian.”

# Diffuse Abnormalities

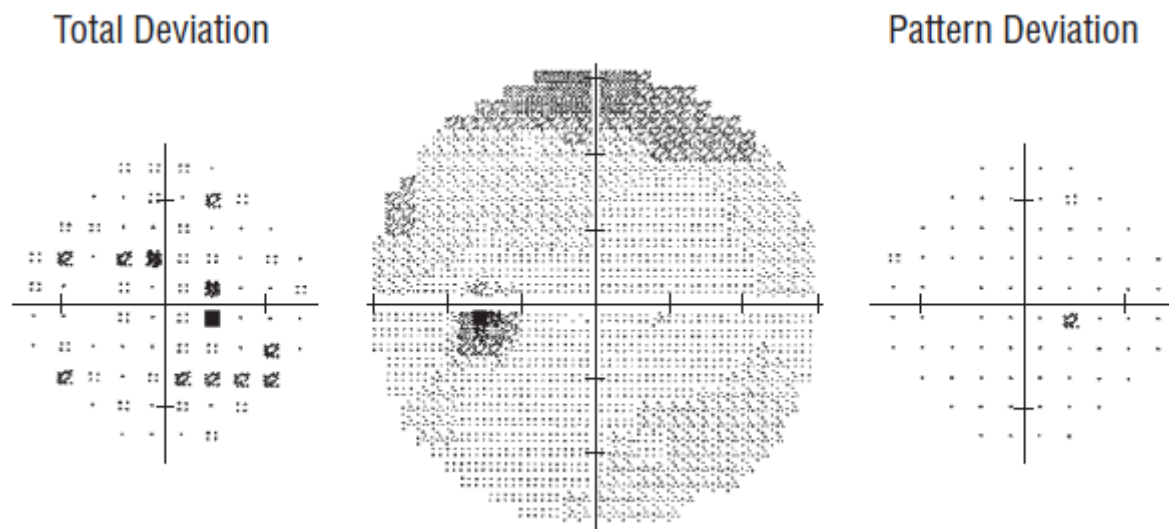
- Multiple Foci
- Widespread
  - Can also be called a “generalized depression” (from the IIHTT criteria)
- Total Loss

# Multiple Foci



“Visual field loss that includes 2 or more clusters of abnormal points ( $P < 5\%$ ) located in different areas of the visual field that do not correspond to a particular abnormality pattern. The loss must be present in both the total and pattern deviation plots.”

# Widespread



“Diffuse visual field loss that includes all 4 quadrants. The Glaucoma Hemifield Test may show a general reduction of sensitivity or the MD must have a  $P$  level  $< 5\%$ . The CPSD/PSD must not have a  $P$  level  $< 5\%$ . The majority of the abnormal points on the total deviation plot are not abnormal on the pattern deviation plot.”

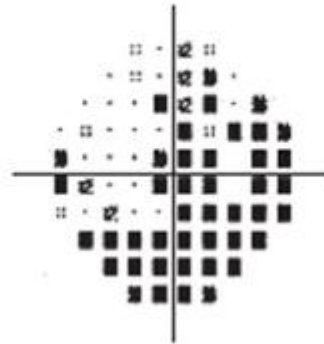
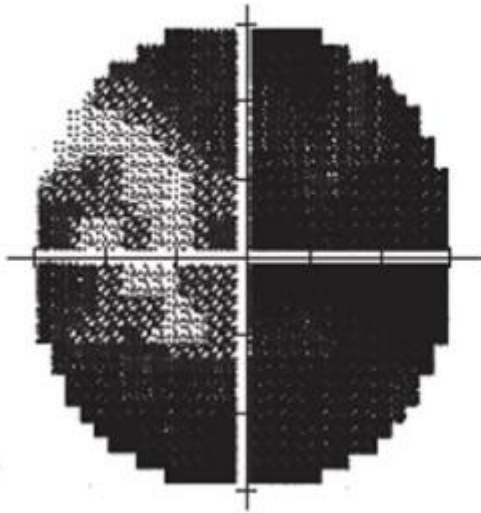
(quoted from the guidelines of the OHTS, IHTT, ONTT)

# Total Loss

Total Deviation



Pattern Deviation



Visual acuity = 20/50  
Foveal threshold = 13 dB  
Mean deviation = -22.02 dB,  $P < .05$

“Severe widespread visual field loss ( $MD \leq -20.00$  dB) with visual acuity not totally impaired”

(quoted from the guidelines of the OHTS, ONTT)

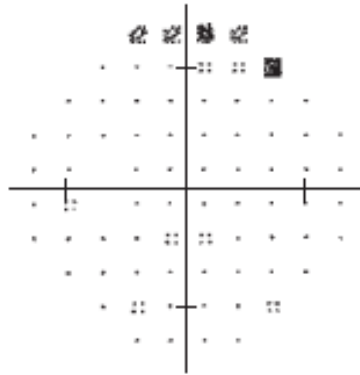
# Artifactual/Retinal Abnormalities

- [Superior Depression](#)
- [Inferior Depression](#)
- [Peripheral Rim](#)
- [Partial Peripheral Rim](#)
- [Cloverleaf](#)

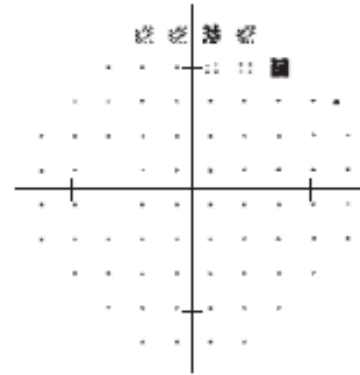
(Trial lens artifact should be particularly suspected in cases of high plus lenses. Retinal disease must be suspected in cases where no trial lens was used.)

# Superior Depression

Total Deviation



Pattern Deviation

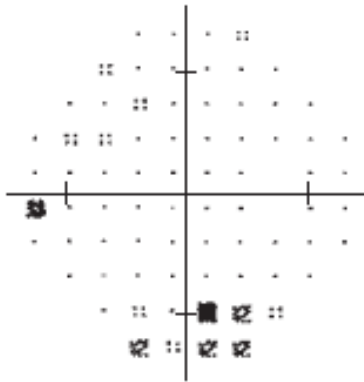


“Two or more abnormal points in the very superior region.”

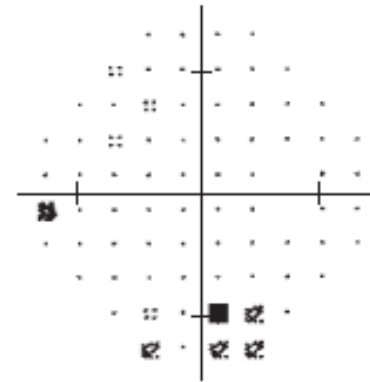
(quoted from the guidelines of the ONTT, OHTS, IIHTT)

# Inferior Depression

Total Deviation



Pattern Deviation



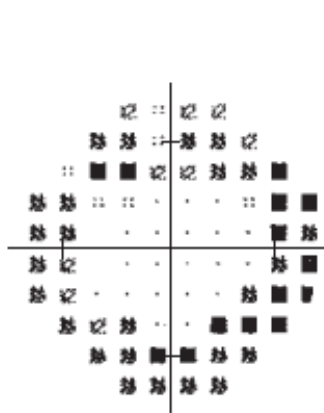
“Two or more abnormal points in the very inferior region.”

(quoted from the guidelines of the ONTT, OHTS, IIHTT)

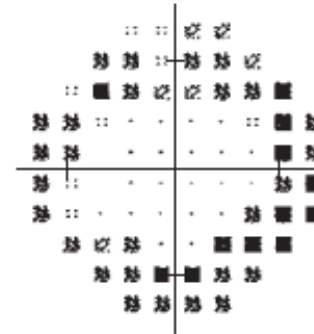


# Peripheral Rim

Total Deviation



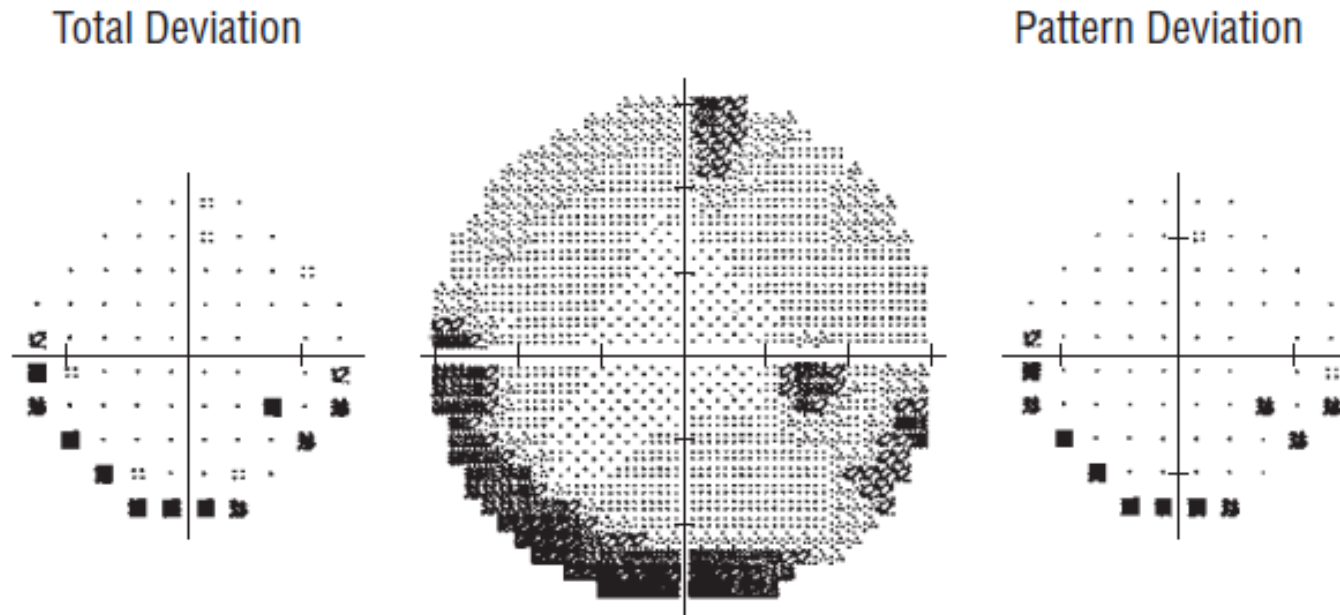
Pattern Deviation



“Generally continuous visual field loss outside 15° in all 4 quadrants, usually with no visual field loss inside 15° on either deviation plot. There must be visual field loss temporal to the blind spot.”

(quoted from the guidelines of the ONTT, OHTS)

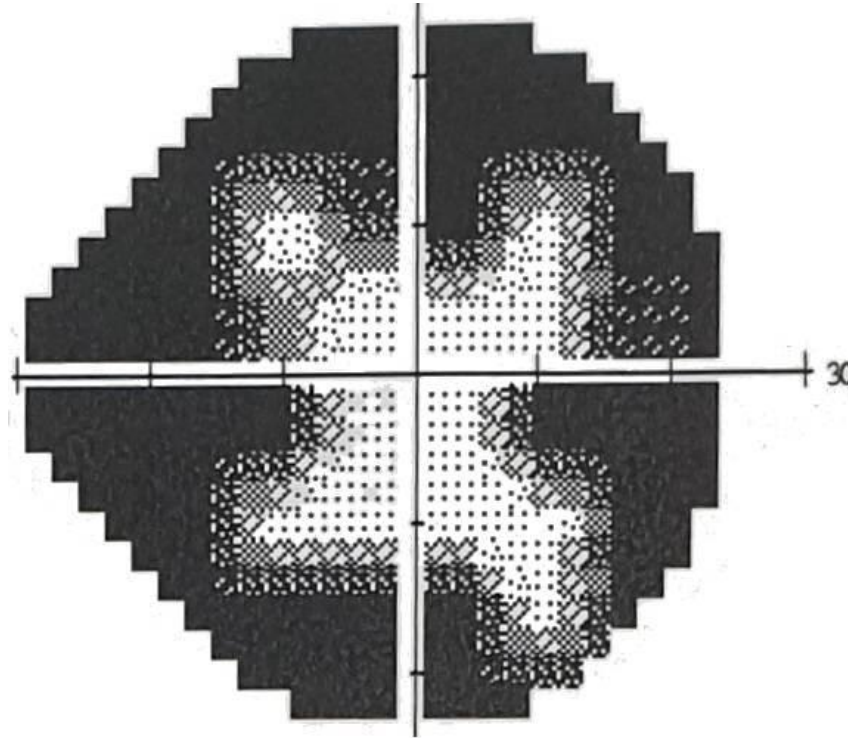
# Partial Peripheral Rim



“Generally continuous field loss outside 15°, but not in all quadrants and must have some curvature.”

(quoted from the guidelines of the ONTT, OHTS, IIHTT)

# Cloverleaf



Preserved sensitivity centered 9 x 9 degrees from fixation with sensitivity generally markedly reduced in all other locations within the quadrant. It is associated with a high false negative rate

# Nonspecific Abnormality

When none of the designations included in the classification system are suitable for describing a given abnormality, the examiner can apply the term 'nonspecific abnormality'