

# TERMINOLOGIES IN NEURO-OPHTHALMOLOGY



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All about the Eye

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## Terminologies in neuro-ophthalmology

- Diseases of the macula can sometimes mimic an optic neuropathy
- Maculopathy tends to cause parallel losses in color discrimination and visual acuity, unlike optic nerve disease, which often causes a disproportionately greater loss in color vision than that in visual acuity.
- Visual field deficits in maculopathy tend to be focal and central, whereas deficits in optic neuropathy are larger, often cecocentral, and part of a generalized depression of visual field sensitivity.

Clinical Finding	Optic Neuropathy	Retinopathy
<b>Symptom</b>		
Metamorphopsia	Rare	Common
Pain	Common in optic neuritis	Rare
Photophobia/Glare	Rare	Sometimes
Photopsia	Rare	Common
Transient visual obscurations	Sometimes with optic disc edema	Rare
<b>Sign</b>		
Afferent pupillary defect	Common if unilateral or bilateral asymmetric	Rare
Amsler grid finding	Absent lines	Distorted lines
Funduscopy findings	Normal, pale, or swollen disc	Normal or pale optic disc
	Macula normal	Macula normal, edematous, or abnormal
Photostress testing	Normal	Delayed
Reduced visual acuity	Common	Common
Visual field defect	Central scotoma, nerve bundle defect	Central scotoma

- Common maculopathies and retinopathies that are often mistaken for optic nerve disease include
  1. Acute idiopathic blind-spot enlargement, which overlaps with multiple evanescent white dot syndrome, and cone dystrophy.
  2. Cancer-associated retinopathy (CAR)
  3. Melanoma-associated retinopathy (MAR).
  4. Central serous retinopathy,
  5. Cystoid macular edema,
  6. Acute zonal occult outer retinopathy (AZOOR),

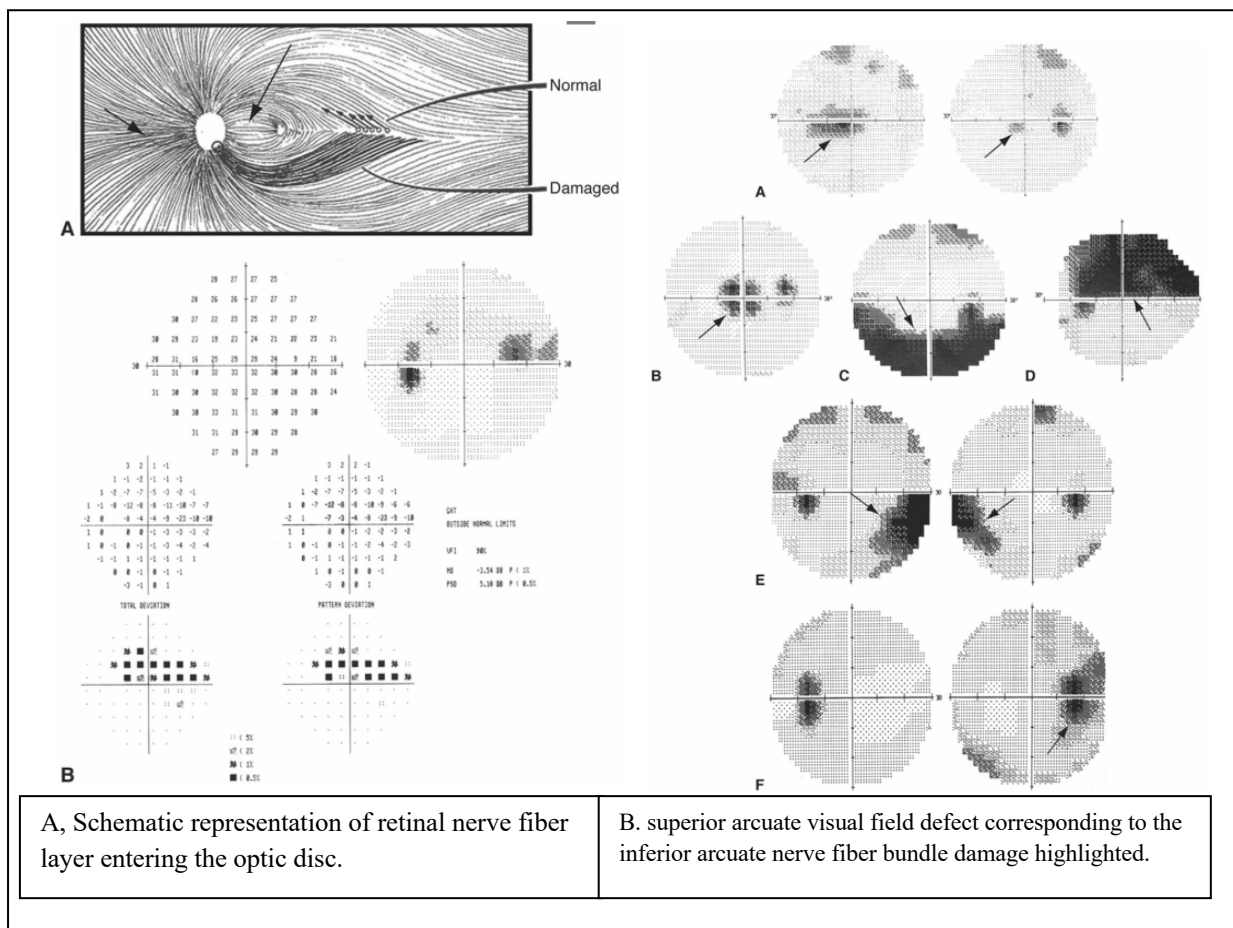
## Optic Neuropathy

Clinically, patients with optic neuropathies present with

1. Visual acuity loss,
2. Visual field loss,
3. Dyschromatopsia,
4. An RAPD (in patients with unilateral or asymmetric damage).
5. The optic disc may appear normal, atrophic, or swollen.

## Visual Field Patterns in Optic Neuropathy

- Retinal ganglion cell nerve fibers enter the optic nerve head in 3 major groups-
  1. Papillomacular fibres, (long arrow)
  2. Arcuate fibres (inferior bundle highlighted)
  3. Nasal radiating fibres. (short arrow)
- Lesions of the optic nerve thus result in 3 categories of visual field loss :



### 1. Papillomacular fibers:

- Cecocentral scotoma (A)
- Paracentral scotoma (A)
- Central scotoma (B)

### 2. Arcuate fibers:

- Arcuate scotoma (nerve fiber bundle defect C)
- Altitudinal defect (broader region of arcuate fibers D)
- Nasal (step) defect (temporal portion of arcuate fibers E)

➤ These fibers align along the temporal horizontal retinal raphe, so that damage to them produces defects that do not cross and respect the nasal horizontal meridian.

### 3. Nasal radiating fibers:

- Temporal wedge defect

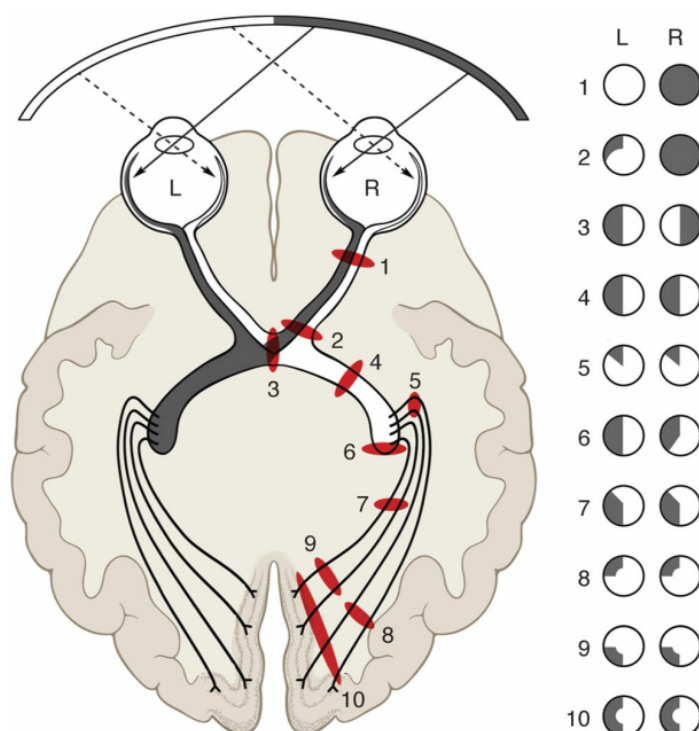
### 4. Blind-spot enlargement

- Results from optic disc edema of any cause, because of displacement of peripapillary retina. (F)

**A**, Cecocentral scotoma (left; arrow); paracentral scotoma (right; arrow).  
**B**, Central scotoma (arrow).  
**C**, Arcuate scotoma (arrow).  
**D**, Broad arcuate (altitudinal) defect (arrow).  
**E**, Nasal arcuate (step) defects (arrows).  
**F**, Enlarged blind spot (arrow).

**Table 4-2 Glossary of Perimetric Terms**

Term	Characteristics
<b>Characteristics of the visual field defect</b>	
Absolute	No stimulus perceived in the affected area
Relative	Bigger and brighter stimuli may be perceived in the affected field, but smaller, dimmer targets are not seen. The size and shape of the visual field defect, therefore, change inversely with changes in size and/or intensity of the presented stimulus. Defects may be described as shallow when only the smallest or dimmest targets fail to be identified or deep if bright objects are not detected in the central portion of the defect.
<b>Terms describing visual field defects</b>	
Scotoma	Area of depressed visual function surrounded by normal visual function (eg, the blind spot) (see Fig 4-3A)
Central	Involves fixation only (see Fig 4-3B)
Cecocentral	Extends from fixation temporally to the blind spot (see Fig 4-3A, left panel)
Paracentral	Involves a region next to, but not including, fixation (see Fig 4-3A, right panel)
Pericentral	Involves a region symmetrically surrounding, but not involving, fixation
Arcuate	Corresponds to and represents nerve fiber bundle loss (see Fig 4-3C)
Altitudinal	A more extensive arcuate defect involving 2 quadrants in either the superior or inferior field (see Fig 4-3D)
Quadrantanopia	One quadrant of visual field involved
Hemianopia	One half of visual field involved, either nasal or temporal (see Fig 4-26)
<b>Description of bilateral visual field defects with respect to spatial localization and extent</b>	
Homonymous	Same side of visual space affected in each eye (see Fig 4-26)
Bitemporal	Opposite temporal sides of visual field space affected in each eye (see Fig 4-26)
Complete	Entire field affected
Incomplete	A portion of the field spared (see Fig 4-26)
Congruity	Tendency for homonymous field defect to be symmetric (ie, to have a similar size, location, and shape in each eye's field)







## Scotoma

### Definition

An area of lost or depressed vision within the visual field, surrounded by an area of less depressed or of normal vision.

### Types

Absolute scotoma	An area within the visual field in which perception of light is entirely lost.
Relative scotoma	An area of the visual field in which perception of light is only diminished, or loss is restricted to light of certain wavelengths
Negative scotoma	A scotoma appearing as a blank spot in the visual field; the patient is unaware of it, and it is detected only by examination.
Positive scotoma	One which appears as a dark spot in the visual field by the patient
Central scotoma	An area of depressed vision corresponding with the fixation point and interfering with or abolishing central vision.
Peripheral scotoma	An area of depressed vision toward the periphery of the visual field.
Physiologic scotoma	That area of the visual field corresponding with the optic disk, in which the photosensitive receptors are absent.
Annular scotoma	A circular area of depressed vision surrounding the point of fixation
Arcuate scotoma	An arc-shaped defect of vision arising in an area near the blind spot and extending toward it
Centrocecal scotoma	A horizontal oval defect in the visual field situated between and embracing both the fixation point and the blind spot
Color scotoma	An isolated area of depressed or defective vision for color in the visual field.
Hemianopic scotoma	Depressed or lost vision affecting half of the central visual field
Mental scotoma	In psychiatry, a figurative blind spot in a person's psychological awareness, the patient being unable to gain insight into and to understand his mental problems; lack of insight
Ring scotoma annular	A scotomatous zone that encircles the point of fixation like a ring, not always completely closed but leaving the fixation point intact.
Scintillating scotoma	Blurring of vision with the sensation of a luminous appearance before the eyes, with a zigzag, wall-like outline; called also teichopsia.