

Optic Neuropathy: Investigations

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Optic Neuropathy

- Diminution of vision
- Color vision deficit
- Central scotoma
- Relative afferent pupillary defect
- Swollen, pale or normal optic disc

Investigations

Check:

- Color vision (Pseudoisochromatic plates)
- Visual field (Automated perimetry)
- Optic nerve conduction (Visual evoked potential)
- Optic nerve imaging (Fundus photo, OCT, MRI, CT)
- Specific tests & procedures

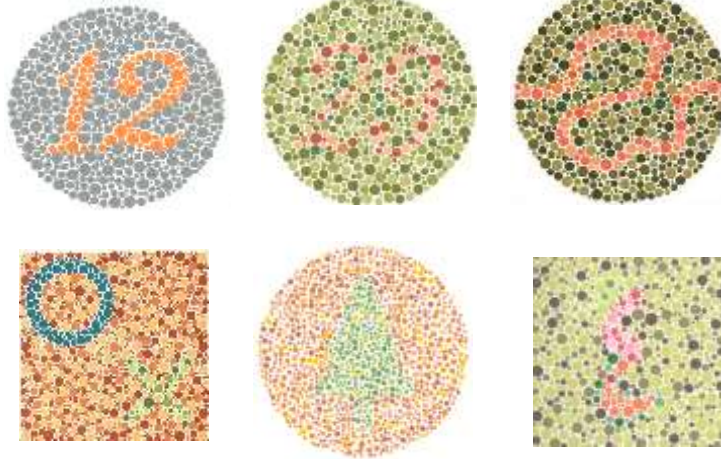
Color Vision Testing



Pseudoisochromatic plates:

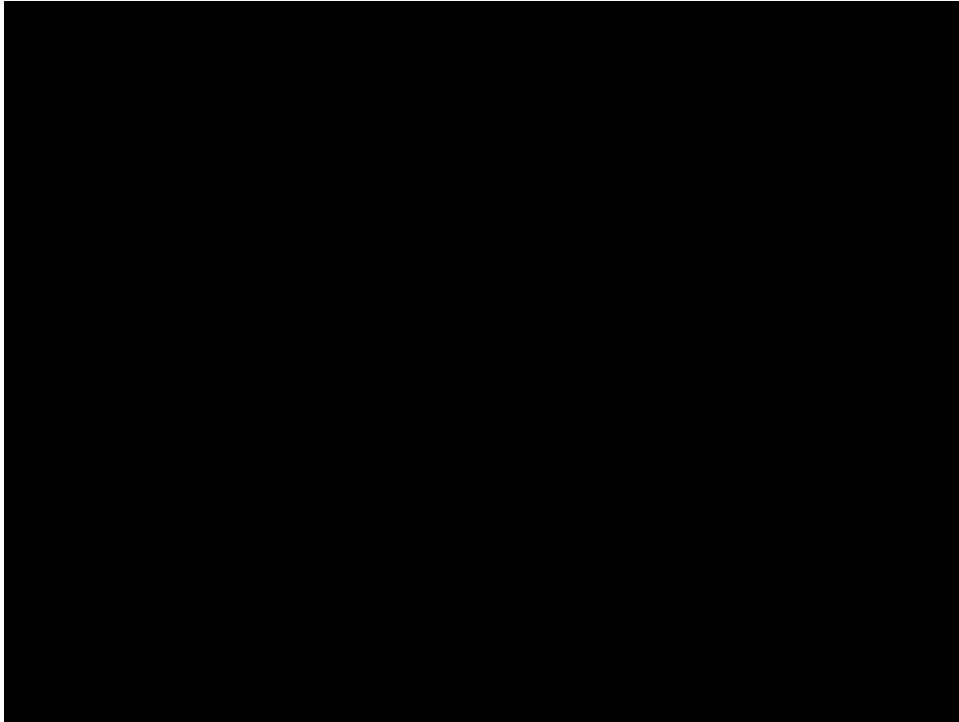
- Designed for screening congenital color vision deficiency.
- composed of dots of different colors and sizes. Some of the dots form symbols like numbers, shapes or winding lines.
- The symbol and background dots seem isochromatic to color deficient people, so they can't differentiate them. Normal persons can detect the color difference and recognize the symbols.

Color Vision Testing



Color Vision Testing

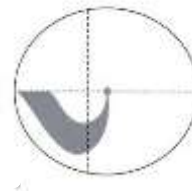
Rt Eye: ?/12 Lt Eye: ?/12



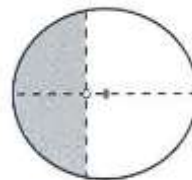
Visual Field Testing



1. Defects extend from blind spot:
= Nerve fiber bundle defects
(pre- chiasmal lesions)

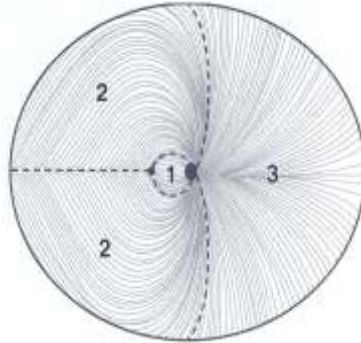


2. Defects extend from fixation:
= Hemianopia
(chiasmal & retro-chiasmal lesions)



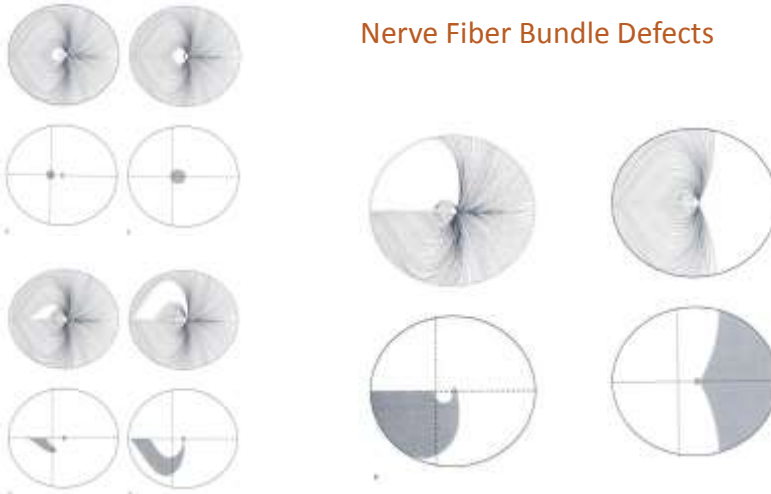
Visual Field Testing

Nerve Fiber Bundles

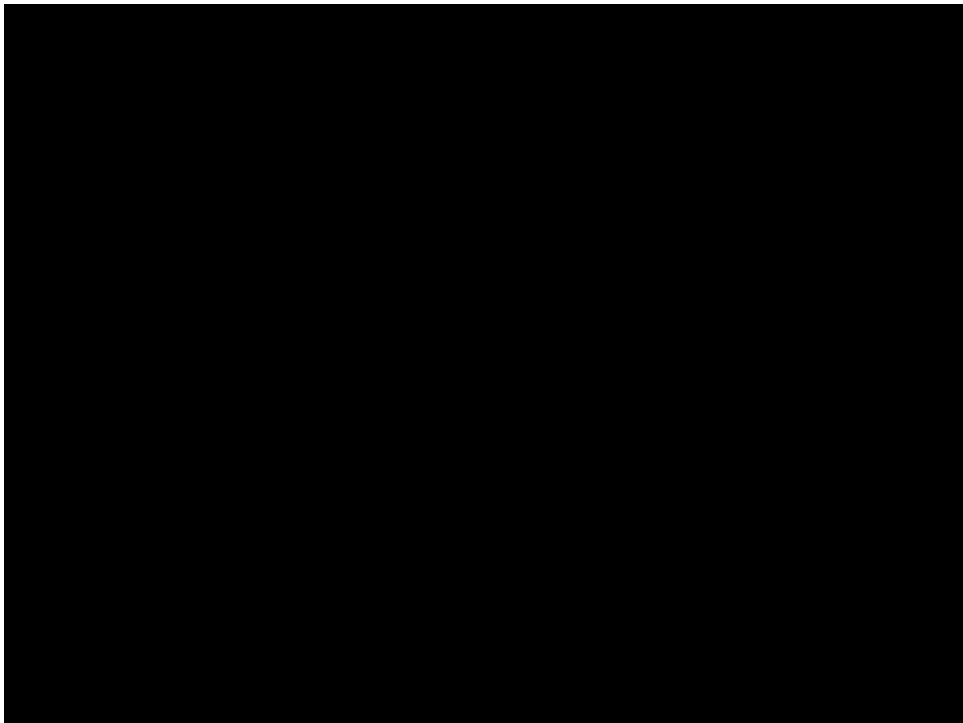
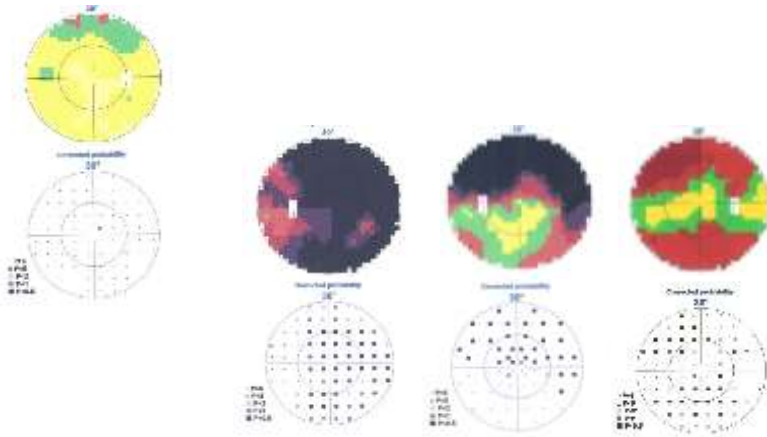


Visual Field Testing

Nerve Fiber Bundle Defects



Visual Field Testing



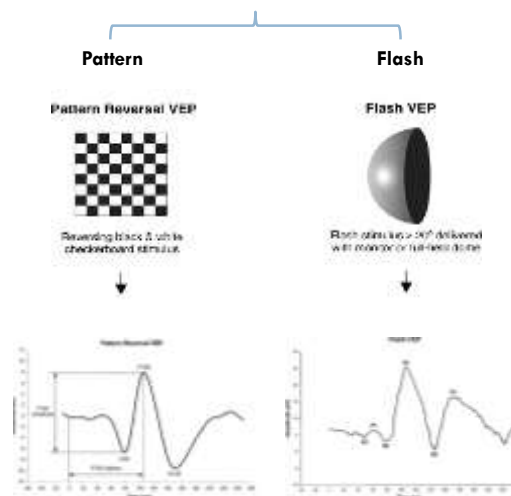
Visual Evoked Potential



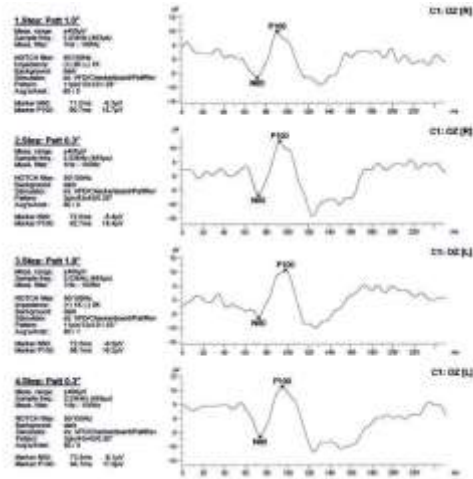
Indications:

- Sub-clinical optic neuropathy with apparent normal examination
- Occult visual pathway dysfunction in patients with multiple sclerosis.

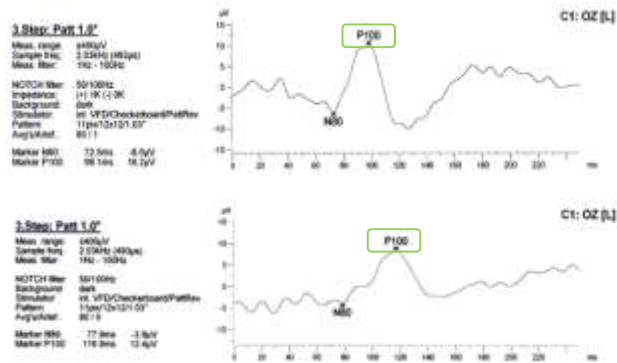
Visual Evoked Potential (VEP)

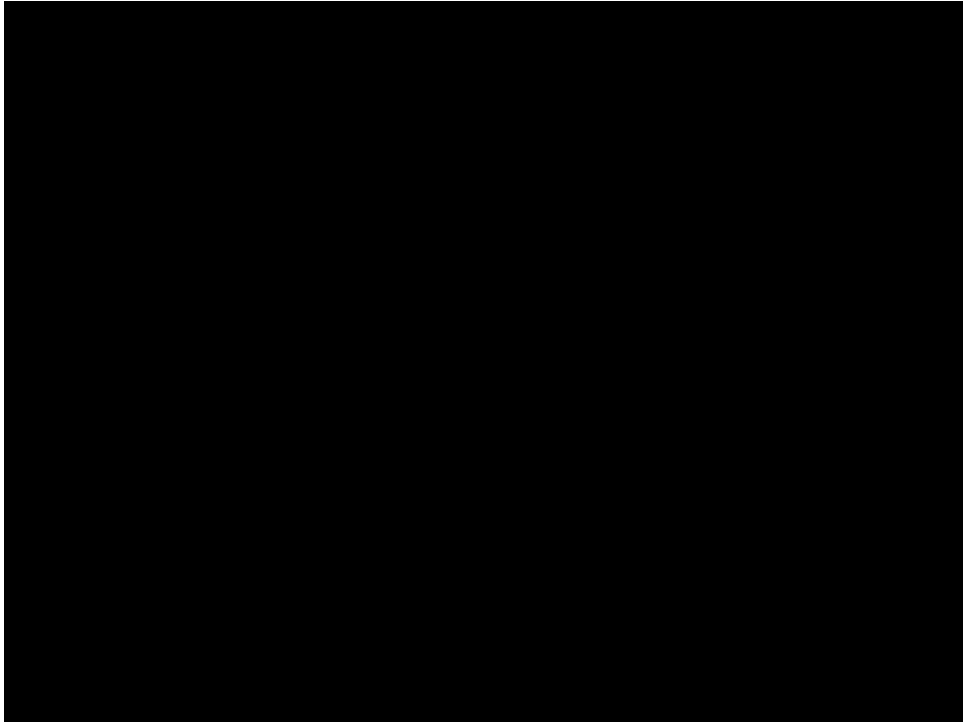


Normal Pattern VEP



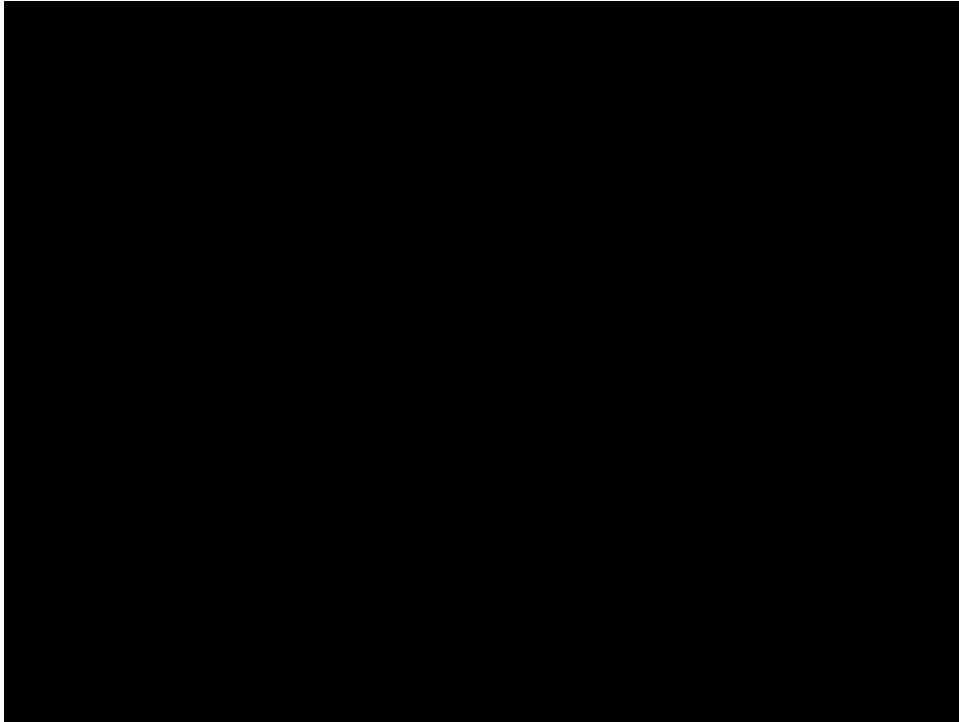
Abnormal Pattern VEP





Fundus Photo



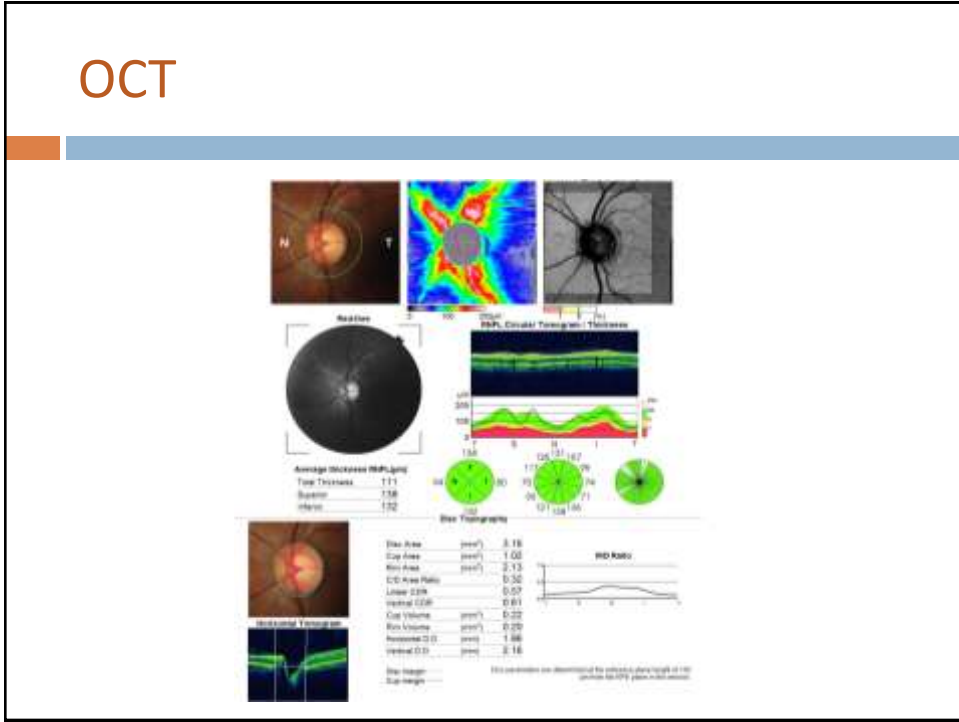


OCT

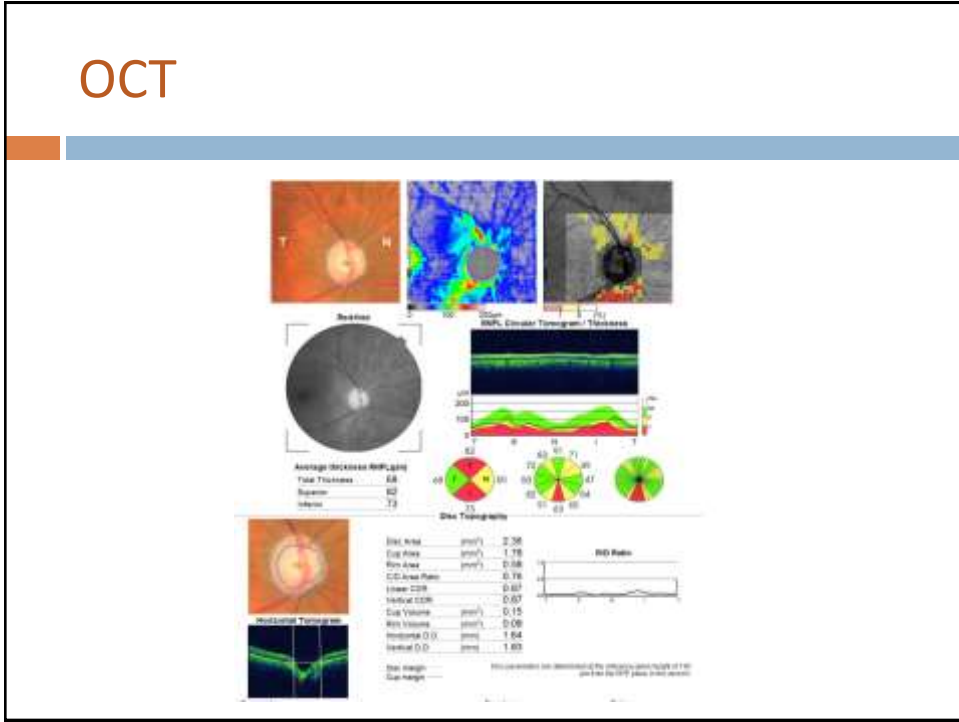


- Evaluation of optic disc
- Evaluation of nerve fiber layer thickness

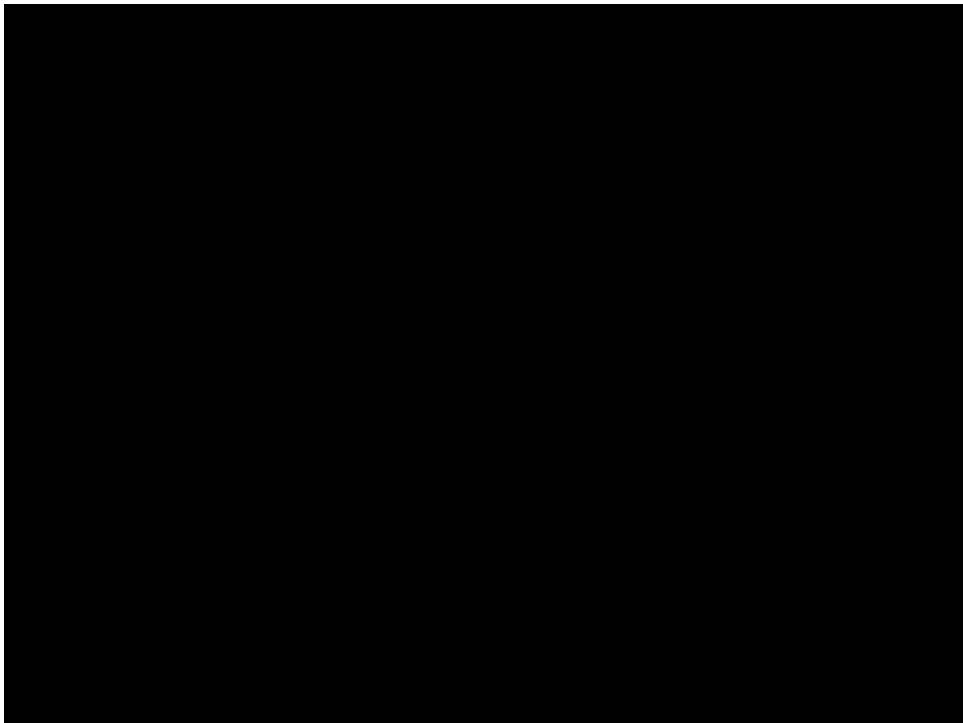
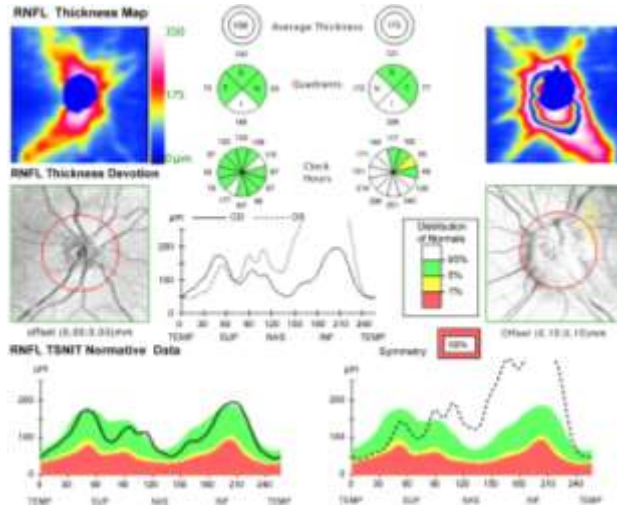
OCT



OCT



OCT



Neuroimaging

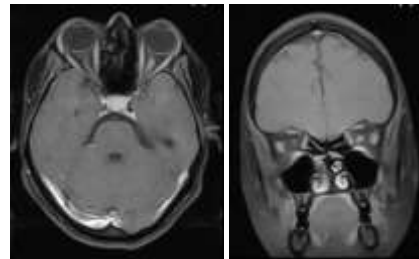


Indications:

- Optic neuritis, MS
- Atypical optic neuritis
- Traumatic optic neuropathy
- Optic atrophy (with no history of hereditary, ischemic or toxic etiology)

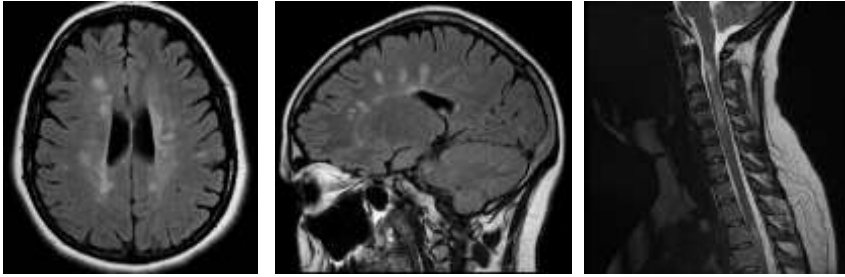
Neuroimaging

- Optic neuritis



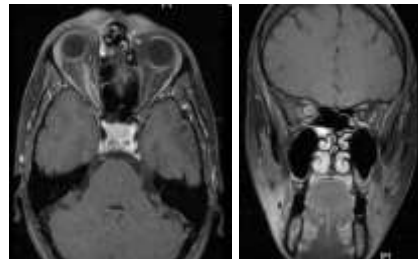
Neuroimaging

- MS



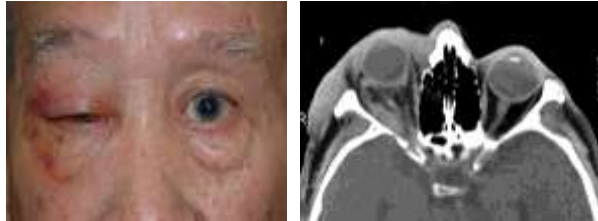
Neuroimaging

- A typical optic neuritis



Neuroimaging

- Traumatic optic neuropathy



Specific Tests & Procedures

- Blood glucose, lipid (non-arteritic AION)
- CBC, ESR,CRP , STA biopsy (arteritic AION)
- CBC, ESR, CRP, serological testing , tuberculin test, blood cultures (infectious optic neuropathy)
- Spinal tap (infiltrative optic neuropathy)
- Gene mutation study (LHON)
- Vit B12 (nutritional optic neuropathy)

Conclusion

- Ophthalmic investigations are important for diagnosis and follow up of patients as well as documentation of patients' conditions.
- Investigations for optic neuropathy include color vision and visual field testing, neuroimaging, fundus photography and OCT of the optic nerve.
- Good utilization of investigations saves time, effort and money for patients and preserves clinical resources.

Thank you