


## Glaucoma: basics

John Placide, MD, MPH  
 OAO 2024  
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## Overview

Def:


- optic neuropathy, progressive ON damage with characteristics VF loss

IOP? high IOP ≠ glaucoma but the strongest risk factor

- the only modifiable

Other risk factors:

- Low CCT
- Race
- Age
- Family hx



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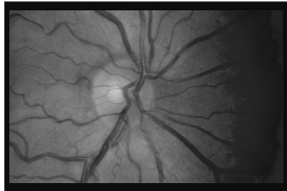
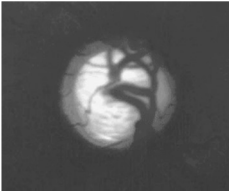
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## ONH damage

Damage: predilection to sup and inf poles (ISNT rule)

*AAO PPT*



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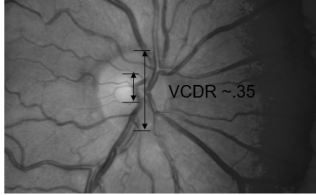
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## ONH damage

Exam: vertical cup-disc ratio

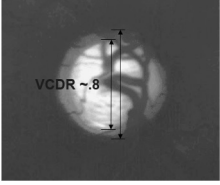
Normal ONH




VCDR ~.35

AAO PPT

Glaucomatous ONH



VCDR ~.8




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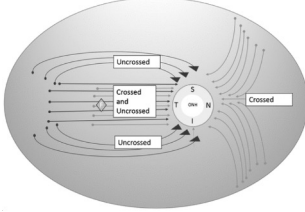
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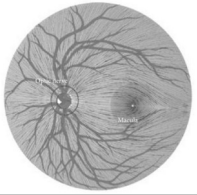
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## RNFL




*Dinkin*



*Costello*

Ref:  
Dinkin M. Trans-synaptic Retrograde Degeneration in the Human Visual System: Slow, Silent, and Real. *Curr Neurol Neurosci Rep.* 2017; 17(2):16. doi:10.1007/s11910-017-0252-2  
Costello P. The afferent visual pathway: designing a structural-functional paradigm of multiple sclerosis. *ISRN Neurol.* 2013;2013:134658. Published 2013 Nov 6. doi:10.1155/2013/134658




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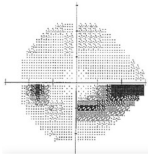
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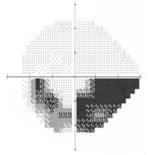
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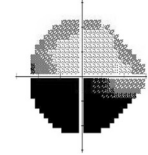
## Visual field changes



*Cioffi, AAO*




*Sowka*



*Henderson et al*

Ref:  
Sowka, Joseph. Visual field defects common in glaucoma subtypes. *Review of optometry.*  
Henderson, A.O., Jiang, H. & Wang, J. Characterization of retinal microvasculature in acute non-arteritic anterior ischemic optic neuropathy using OCT retinal functional imaging: a prospective case series. *Eye and Vis.* 6, 1 (2019). <https://doi.org/10.1186/s12918-019-0150-x>




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# Work up

## Initial work up:

- VA, APD, color plates, IOP (G-applanation), CCT
- Gonio, stereo disc photos
- OCT rNFL + GCA (macula)
- HVF




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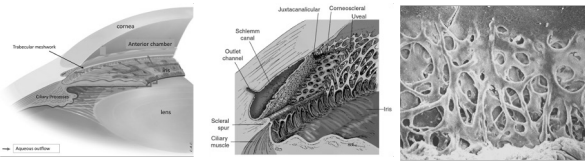
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# POAG: Management

$$IOP = \frac{\text{Aqueous Formation Rate } (\mu\text{L}/\text{min})}{\text{Outflow Facility } (\mu\text{L}/\text{min}/\text{mmHg})} + \text{Episcleral Venous Pressure (mmHg)}$$



BCSC 2022




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# POAG: Management

$$IOP = \frac{\text{Aqueous Formation Rate } (\mu\text{L}/\text{min})}{\text{Outflow Facility } (\mu\text{L}/\text{min}/\text{mmHg})} + \text{Episcleral Venous Pressure (mmHg)}$$

## Pew! Pew! ( laser) vs Drops?

- GLT study (1990): ALT > Timolol
  - ALT grp:
    - lower IOP with fewer drops
    - better VF at 7&9yrs
    - \*\*prior to prostaglandins, CAI, alpha agonists and SLT

Ref: Speeth GL. The Glaucoma Laser Trial (GLT). Ophthalmic Surg. 1995;16(4):227-228.




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## POAG: Management

$$IOP = \text{Aqueous Formation Rate } (\mu\text{L}/\text{min}) - \text{Outflow Facility } (\mu\text{L}/\text{min}/\text{mmHg}) + \text{Episcleral Venous Pressure } (\text{mmHg})$$

Medications

- Prostaglandins; e.g Latanoprost
- BB: e.g timolol
- Alpha-agonists: e.g brimonidine
- CAIs: dorzolamide
- Combination: Cosopt, Combigan
- RKI: Rhopressa (netadursil)




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## Follow up

Work up:

- VA, APD, IOP (G-applanation)
- OCT/HVF
- Annually-> gonio, stereo disc photos




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## Management

$$IOP = \text{Aqueous Formation Rate } (\mu\text{L}/\text{min}) - \text{Outflow Facility } (\mu\text{L}/\text{min}/\text{mmHg}) + \text{Episcleral Venous Pressure } (\text{mmHg})$$

When drops fail?

- MIGS
- Cytophotocoagulation (CPC)
- Trabeculectomy
- Tube shunts




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## Take home points

- Glaucoma 2nd cause of blindness worldwide
- POAG is a diagnosis of exclusion
- APD, color plates can tease out mimickers
- Disc photos > exams



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## Thank you!



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