Evaluating the Glaucoma Suspect

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What is a glaucoma suspect?

- someone with borderline signs
  - you're suspicious about the disk appearance
  - the IOP appears elevated
  - there appears to be field loss
- how do they present?
  - come in for a check because of positive family history
  - incidentally noted high IOP, suspect disks
  - symptomatic field loss

Optic Nerve Head Evaluation 1

- Cup-disk ratio (C/D)
  - "cupping" is the hallmark of GON, ultimately leading to "bean-pot" appearance
  - greater than 0.3 is suspect, asymmetry is suspect, change is suspect
- Concentric expansion v local expansion - watch carefully for notches as well as concentric increase in cup size
- Other signs
  - slit or wedge defects in NFL
  - splinter hemorrhages
  - "bayonetting" vessels and "lamellar dots"

So …

- a large C/D is suspicious
  - *BUT*
- a given C/D is of limited clinical significance unless additional signs of ONH damage are present

FORGE™ rules

Simple Rules Have No Problems

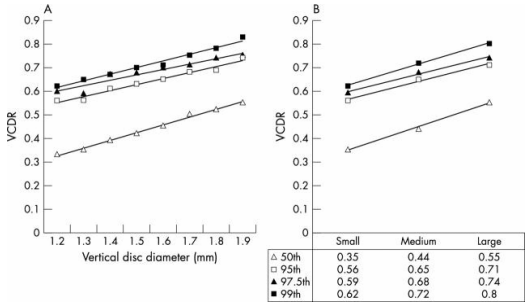
1. **Size**
2. **Rim** (ISNT rule)
3. **Haemorrhage**
4. **Nerve fibre layer** loss or defects
5. **Peripapillary atrophy** (beta zone)

Optic Nerve Head Evaluation II

- 5 rules for disk assessment
  - what is the disk size?
  - where is the rim, does it obey the *ISNT* rule?
  - can you see a hemorrhage?
  - look for NFL defects
  - is there *beta*-zone peripapillary atrophy?

1. How big (or small) is the disk?

- SLE with condensing lens
- Use a bright thin slit beam at the inner edge of the disk
- Know the conversion factor for your lens
  - Volk 78D 1.1x
  - Volk SF 1.5x
- Think small, medium, large (*KISS*)
  - small = <1.3mm (~24% of disks)
  - medium = 1.3-1.8mm (~50% of disks)
  - large = >1.8mm (~25% of disks)



	Small	Medium	Large
△ 50th	0.35	0.44	0.55
□ 95th	0.56	0.65	0.71
▲ 97.5th	0.59	0.68	0.74
■ 99th	0.62	0.72	0.8

J G Crowston. The effect of optic disc diameter on vertical cup to disc ratio percentiles in a population based cohort: the Blue Mountains Eye Study. Br J Ophthalmol. 2004; 88 (6): 766-770.

2. What's the rim look like?

- look at rim contour rather than colour
- green (red-free) filter aids contour assessment
- can be helpful to follow the vessel paths

The *ISNT "rule"*

Noga Harizman et al. The ISNT Rule and Differentiation of Normal From Glaucomatous Eyes. *Arch Ophthalmol*. 2006;124:1579-1583.

3. Is there a hemorrhage?

- easily missed unless carefully, specifically looked for
- even then can be overlooked
- herald progression
- usually last 2-6 months

4. Can you see a NFL defect?

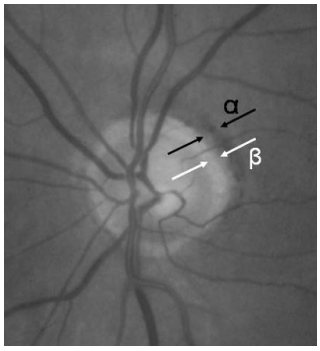
- is always more difficult to detect than texts and lecturers would have you believe!!!
  - look for a loss of the striated NFL appearance
  - always more difficult to see a negative finding than a positive one
- use red-free light, make it bright
- useful in detecting NFL loss prior to disk change

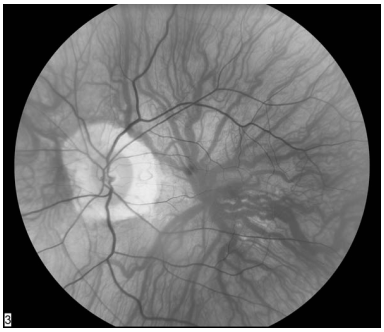
5. Is there beta zone peri-papillary atrophy?

- Peripapillary atrophy (PPA) of the choroid & RPE is frequently associated with glaucoma
- zone beta ("**b**eside", "**b**are")-
  - PPA involving choroid alone
  - appears as a whitish discoloration of the peripapillary tissue
  - often corresponds to areas with greater NFL loss and VF defects
- zone alpha ("**a**way")-
  - RPE crescent surrounding zone beta
  - lacks the specificity of zone beta

beta-PPA

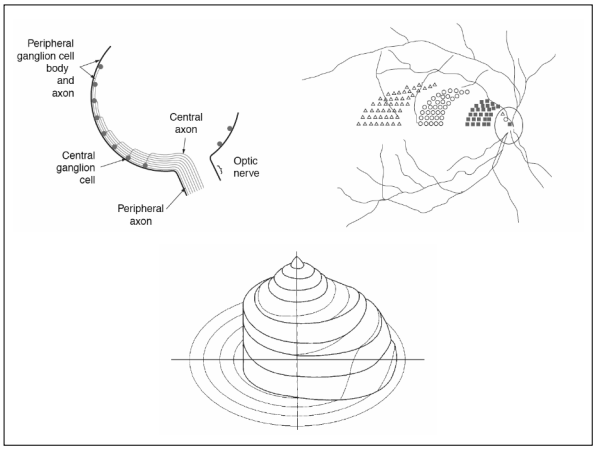
- can be a confounder in disk assessment by making rim appear larger than it really is
- common in non-glaucomatous eyes (15-25%)





Visual Field Assessment

- are the field changes consistent with glaucomatous loss?
- do changes in the field match the changes in the disk?
- is the field test reliable?
- was the right field test used?
- does the test show progression?



Was the right field test used?

- SEAGIG Guidelines
  - 24-2 for glaucoma suspects and patients with early/moderate damage
  - 10-2 for patients with advanced damage or paracentral scotomas
- Other strategies
  - binocular fields for assessing potential disability
  - binocular Esterman (or Goldman) for driving assessment
  - Matrix FDT and SWAP

Was the field test reliable?

- Performance
  - patient reliability
  - clinician interpretation
- Learning curve
  - for technician: see http://www.seagig.org/toc/APGGuidelinesNMview.pdf
  - for patient: performance improves during first 2-3 tests

OHTS Fields

- of 2509 field tests initially classified as abnormal
  - 58% were confirmed as glaucomatous
  - 9% artefact
  - 11% non-glaucomatous
  - 22% **normal** =

Unreliable fields

- fatigue - cloverleaf pattern
- slow start - Maltese Cross
- trigger happy
- confounders
  - lens rim, lid/brow
  - myopia
  - cataract, small pupil

Does the field fit with the disk?

Optic disk and NFL imaging

- objective, reproducible, quantitative measurements
- supplement to other clinical information ie clinical disk assessment, visual fields
- use in monitoring of disease seems promising but doesn't yet have a good evidence base

What about IOP?

- IOP remains the single most important known risk factor
- Reduction of IOP is
  - the only effective treatment
  - effective in early or late glaucoma
  - effective in ocular hypertension and normal tension glaucoma
- IOP is not helpful in diagnosis
  - overall 50% of glaucoma patients present with IOP of 21mmHg or less

What about central corneal thickness (CCT)?

- OHT Study found thinner corneas (<555_m) associated with elevated risk
- CCT is important because is affects interpretation of IOP
  - thin CCT leads to falsely low IOP readings
  - thick CCT leads to falsely high IOP readings
- so far there is no good evidence that CCT is an independent risk factor for glaucoma

- http://www.gone-project.com/gone-login.cfm