“It’s time to change paradigm. Instead of relying only on IOP and VF, we should consider the appearance of the optic disc and the RNFL. This may be even more important than the VF examination in the future.”

RN Weinreb, 2003
Five Rules for the Assessment of the Optic Nerve Head in Glaucoma

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Five Rules for the Assessment of the Optic Nerve Head in Glaucoma

1. Look first at the rim (and not at the cup)
2. Look at the peripapillary region
3. Look at the retinal nerve fiber layer
4. Look at the lamina cribrosa
5. Look for optic disc hemorrhage

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Rule #1

Identify the Rim: Look at the Scleral Ring and Cup Border

Rim width = distance between the scleral ring and the location where the vessel is bent (cup border) NOT the white
Rim width = distance between the scleral ring and the location where the vessel is bent (cup border)

Clinical Importance of Glaucomatous Signs

Weak

★ ★ Moderate

★ ★ ★ Strong
The Color of the Rim

Cup = Pallor

- If cup = pallor — normal
- If pallor > cup — neurological disorder or glaucoma with very high IOP
- If cup > pallor — glaucoma ★

Non-Glaucomatous Optic Neuropathy

Total pallor

Cup

Pale rim

Pallor > Cup

Diffuse Pallor

Pallor > Cup

Non-Glaucomatous Neuropathy
Glaucoma

Location of kinking of the vessel

Cup

Cup > Pallor

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Rule #2
Look at the Peripapillary Region

Peripapillary Halo

Alpha Zone
Beta Zone ★
Sensitivity 20% to 30%
Specificity 80%
360°—normotensive senil-sclerotic glaucoma

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Rule #3
Look at the Retinal Nerve Fiber Layer
RNFL Red-Free Photographs

Bright striations

With Red - Free light

Hoyt Sign

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Localized RNFL Loss

Better seen with red-free light
Localized RNFL Loss

Localized RNFL loss – wedge-shaped dark area

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Diffuse RNFL loss – diffuse loss of the striate pattern + increased visibility of retinal vessel borders
Normal RNFL

Diffuse RNFL Loss

Striations – brightness
Visibility of peripapillary retinal vessels

Rule #4
Look at The Lamina Cribrosa

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Lamina Cribrosa

Striated pattern (Susanna)

Aquired optic pit (Radius)

Remember That a Normal Large Disc Has a Large Cup
Normal Disc

ISNT rule obeyed

Large cup

Large disc

Cup = Pallor

Be Cautious With Myopic Discs
Cup Size

Rule #5
Look for Optic Disc Hemorrhage

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Flame-shaped hemorrhage

- Normally disappear after 2 to 6 months
- Indicative of glaucoma progression
Detection of disc hemorrhages requires careful optic disc examination.
Detecting Glaucoma

ISNT Rule Is Not Obeyed

Glaucoma
Glucoma – Small Disc

- Peripapillary Halo ★
- Narrowing of Retinal Arteries ★
- Generalized RNFL ★★★
- Large Cup for a Small Disc ★★★

Normal size disc  
Small disc  
Large disc

Small aperture (5 degree) of Welch-Allen direct ophthalmoscope

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Optic Disc Size

Measurement of optic disc size:

- Biomicroscopy:
  - Volk lens
  - Measure size of slit beam
- Correction factors:
  - Volk 60D – x 1.0
  - Volk 78D – x 1.1
  - Volk 90D – x 1.3

Average vertical diameter: 1.8 mm
Average horizontal diameter: 1.7 mm

Optic Disc Size

Size of the cup varies with size of the disc

Identify Small and Large Optic Discs
Small Discs: Average Diameter < 1.5 mm
Large Discs: Average Diameter > 2.2 mm
Nasal Cupping

Hemorrhage

Notch

RNFL defect

Peripapillary atrophy (β zone)

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Glaucoma

RNFL loss
Notching

Cup/Disc Ratio Asymmetry ≥0.2

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Detecting Progression
(Compare Photographs During Follow-Up)
Generalized Rim Thinning

Progressive Rim Thinning

Enlargement of Localized RNFL Defect
Corresponding VF defects (previous slide)

10 Years
Thank You

3D Workshop

Put Your 3D Glasses On
Optic Nerve Head Evaluation Test II

20 seconds/Test

Small disc
Small cup
RNFL reflex
Normal

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Disc hemorrhage
ISNT rule not obeyed
Glaucoma

Large disc
Large cup
ISNT rule obeyed
Normal RNFL
Pallor = Cup
Normal
Notching superiorly
Beta-zone
Superior and inferior RNFL drop-out
ISNT rule not obeyed
Glaucoma

Beta-zone
Notching superiorly and inferiorly
Hemorrhage
Glaucoma
Inferior notching
Inferior beta-zone
Inferior RNFL defect
Glaucoma

ISNT rule not obeyed
Inferior peripapillary halo
Inferior notching
Nasal cupping
Glaucoma
Test 8

ISNT rule obeyed
Whitish RNFL reflex
Normal disc

Test 9

Small disc
Beta-zone
Large cup for a small disc
Nasal cupping
Glaucoma
ISNT rule not obeyed
Inferior peripapillary halo
Inferior notching
Nasal cupping
Glaucoma

Thank You