Advanced Glaucoma
Definition, Monitoring & Follow up

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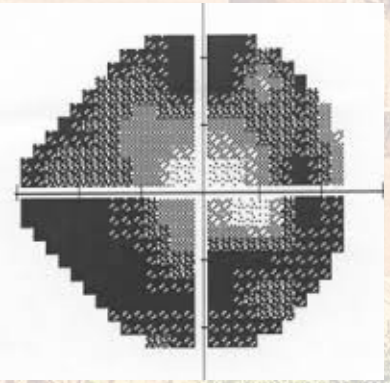
Advanced glaucoma:

what is the magnitude of the problem?

Why is this group Important??

- It affects a broad array of daily activities, with various socioeconomic and health challenges such as:
- Stigmatization, unemployment or underemployment,
- Increased morbidity & mortality
- They are at great danger of losing remaining vision
- Increased risk for driving accidents, falls, as well as mental health difficulties including depression.



Epidemiology

- A significant portion of glaucoma patients presents late in advanced stage of the disease in developing world
- According to a clinic based study in UK, (38%) of newly diagnosed glaucoma patients were in the advanced stage.
- In glaucoma prevalence survey in South Africa, it is found that 45% of those with glaucoma were blind in at least one eye.

What about other developing and underdeveloped country?

What Should you know?

- Definition
- How to diagnose and Follow up
- Identify the challenges?
- Target IOP
- How to treat? Medical? Laser?, Vs Surgical
- What Kind of surgery are you going to do? And Why?

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Definition

Hodapp-Parrish-Anderson (HPA) classification
(One of the most widespread and widely used)

- ❑ The total extent of the perimetric damage (mean deviation, MD and
- ❑ The proximity of the defect to fixation were considered and accordingly severe or advanced glaucoma was the one that met the following criteria:

- the MD is less than –12 dB
- • more than 50% of the depressed points below 5% or more than 25% of the depressed points below 1% on the model deviation probability map
- • at least one point in the central 5○ with sensitivity of 0 dB or at least one point in each hemifield with sensitivity <15 dB in the 5○ of fixation

The European Glaucoma Society (EGS)

proposes a simplified version of the HPA classification for glaucoma staging with cutoff values of MD ≤ 6 dB and 12 dB to classify glaucoma patients into:

Mild, moderate, Advanced

In 2006, Mills et al proposed a new classification similar to that of HPA but with 6 stages

In which the MD criterion must be met and, in addition, one of the additional criteria (Table 4)

- ❑ <u>In this case, AG is subdivided into</u>
- Advanced defect (MD between −12.01 and −20 dB)
- Severe defect (MD ≤ −20.01dB)
- Final stage if it is not possible to perform VF, there is an absence of VF attributed to a central scotoma in the worst eye or visual acuity (VA) of the worst eye ≤ 20/200 attributable to glaucoma

The Advanced Glaucoma Intervention Study (AGIS) used a staging system based on the Humphrey Field Analyser (HFA) 24−2 total deflection mapping

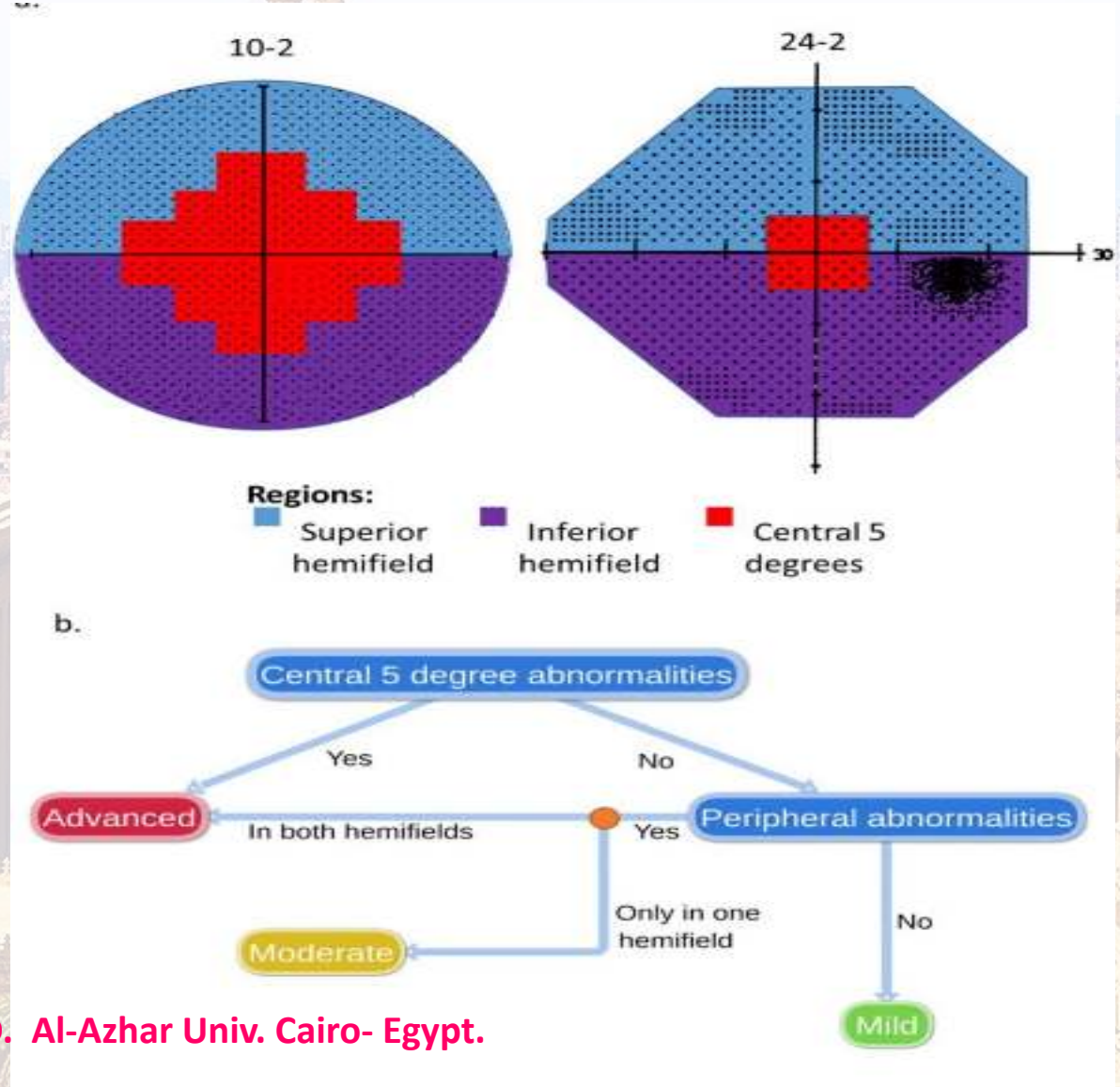
The score is assigned according to the depression of sensitivity in dB observed in different areas of the VF

ranges from 0 (no perimetric damage) to 20 (maximum perimetric damage

- Scores between12 and 17 being considered AG
- Terminal damage between18 and 20

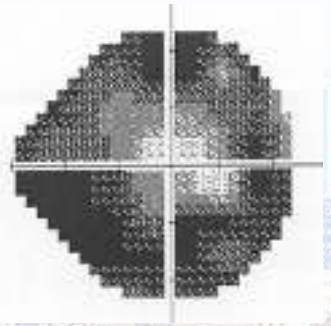
ICD-10 Glaucoma sevrity guide

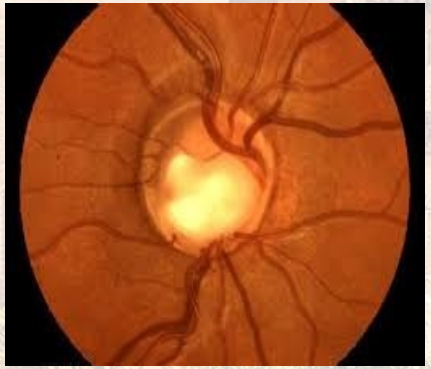
- In order to define severity:
  - ❖ the entire visual field (VF) is divided into three regions: superior hemifield (blue),
  - ❖ inferior hemifield (purple),
  - ❖ central 5 degrees of fixation (red).
- Based on which regions are involved, the guide dictates the severity:
  - ❑ abnormalities within the central region classify an eye as Advanced regardless of the number of hemifields involved.
  - ❑ If the center is not involved then severity is defined based on the number of hemifields abnormalities:
    - ➢ Both hemifields = Advanced;
    - ➢ one hemifield =
    - ➢ Moderate; none = Mild.



Definition

Patients with advanced glaucoma are defined as near total cupping of the optic nerve with/without severe visual field (VF) loss within 10° of fixation, i.e. scotoma encroaching on or splitting fixation.





Challenges

Diagnosis

Follow up

Treatment options

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Detection of Progression

Patient's Symptoms review

Identification of 2ry causes

Monitoring of the ONH Structure & function

Imaging Devices

Visual Field changes

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Frequency of visists

- Given the severe and tenuous nature of AG patients' vision loss,
- **patients with AG require frequent visits** to monitor their IOP control, their optic nerve status, and their visual functioning.
- Some patients might lose significant vision in just a few months between visits when their long-standing IOP control suddenly falters.
- Therefore, patients with advanced glaucoma generally should be seen **every 3 to 4 months**, or even more frequent if they have other risks

Review Patient symptoms

SUBJECTIVE ASSESSMENT

- **Subjective assessment of AG patients visual functions is often the most important indicator of disease progression.**
- **Patients may notice subtle changes in their vision, and they are particularly sensitive to near-fixation defects.**
- **They may report that their vision is getting dimmer or that they need more light to read or perform daily activities.**

Review Patient symptoms

SUBJECTIVE ASSESSMENT

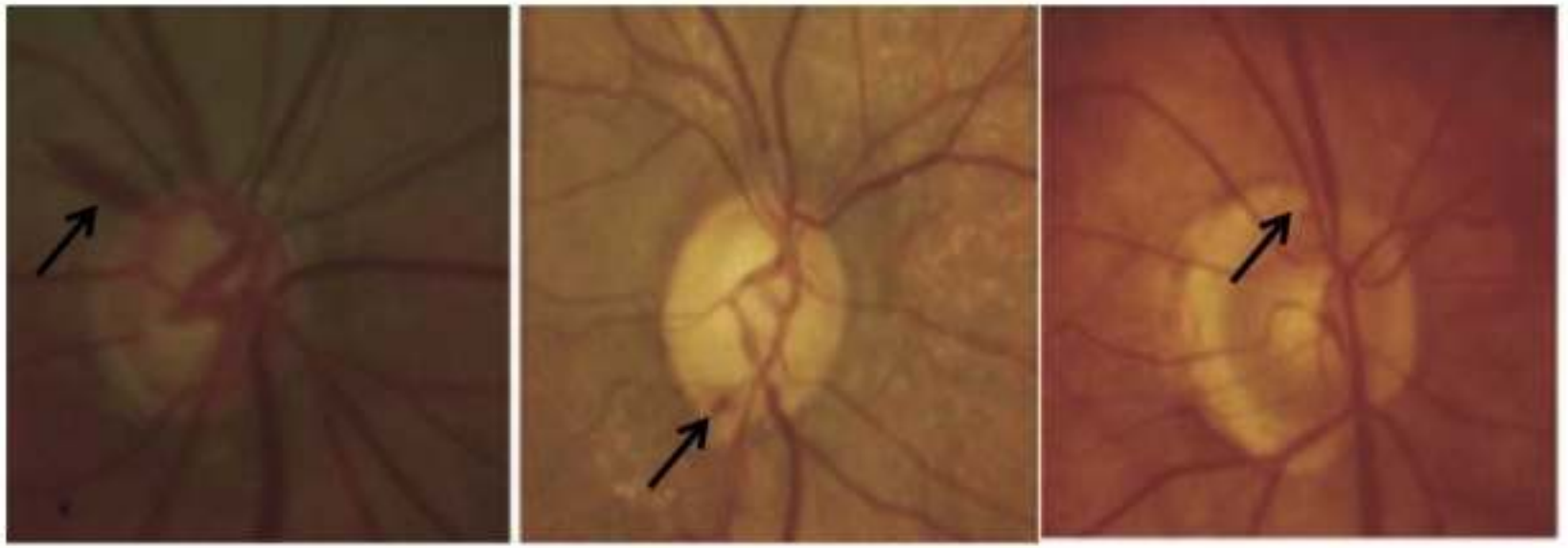
- Increased difficulty with reading or finding the next line of text on a page. Inability to see parts of the words
- Bumping into things more often
- In patients with vision loss from end-stage glaucoma, a drop in measured visual acuity may also be a sign of disease progression
- Transient visual loss

OPTIC NERVE ASSESSMENT

- Detecting glaucomatous changes in the optic nerve is more challenging in eyes with an already thin neuroretinal rim and a 0.9 cup-to-disc ratio than in eyes with thick rims
- Even with high-quality serial stereographic optic disc photographs, subtle changes are easy to miss in eyes with 0.9 cup-to-disc ratios.
- Even so, the optic nerve should still be carefully examined for disc hemorrhages, which may signal progressive damage.

OPTIC NERVE & RNFL ASSESSMENT

- Imaging technologies such as SD-OCT also encounter problems with advanced optic nerve damage.
- On the SD-OCT measurements of the RNFL, the so-called floor effect becomes relevant in eyes with severe thinning.
- RNFL thinning levels off at approximately 40 to 50 µm, perhaps due to residual glial tissue, blood vessels, or other nonneural tissue.
- That said, remaining areas that are less damaged may still be monitored with SD-OCT.
- Generally, we rely more on visual fields than optic nerve imaging for observing patients with advanced glaucoma.

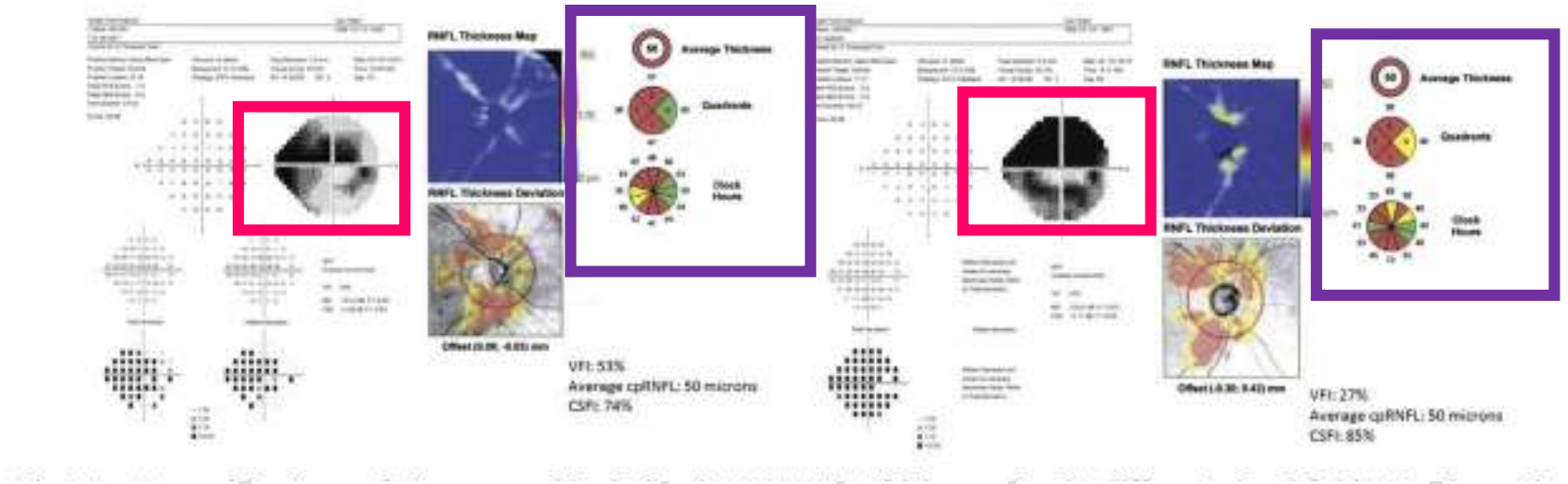


Monitoring of structural changes

- It is difficult to assess subtle changes in the ONH
- Examine carefully & notice document any changes in the NRRA, Zone Beta PPA, **disc Hge**
- VF Changes are less correlated with the structural changes specifically the ONH

Monitoring of structural changes

Examine carefully & notice document any changes in the NRRA, Zone Beta PPA, disc Hge



Imaging Devices

- Not likely very helpful
- Minimal NRRA & RNFL changes happens

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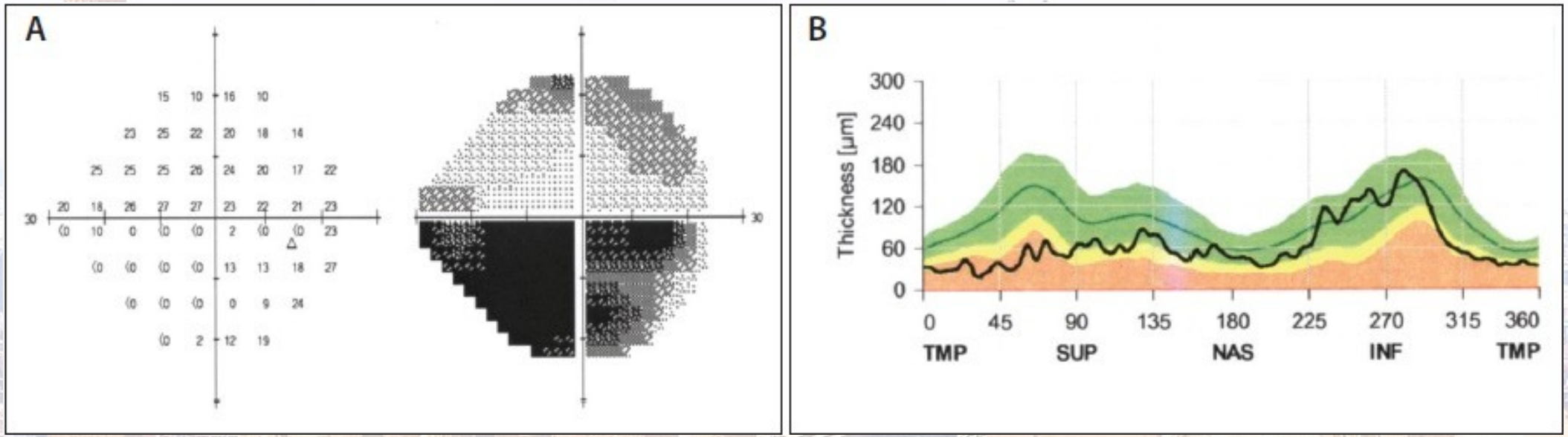
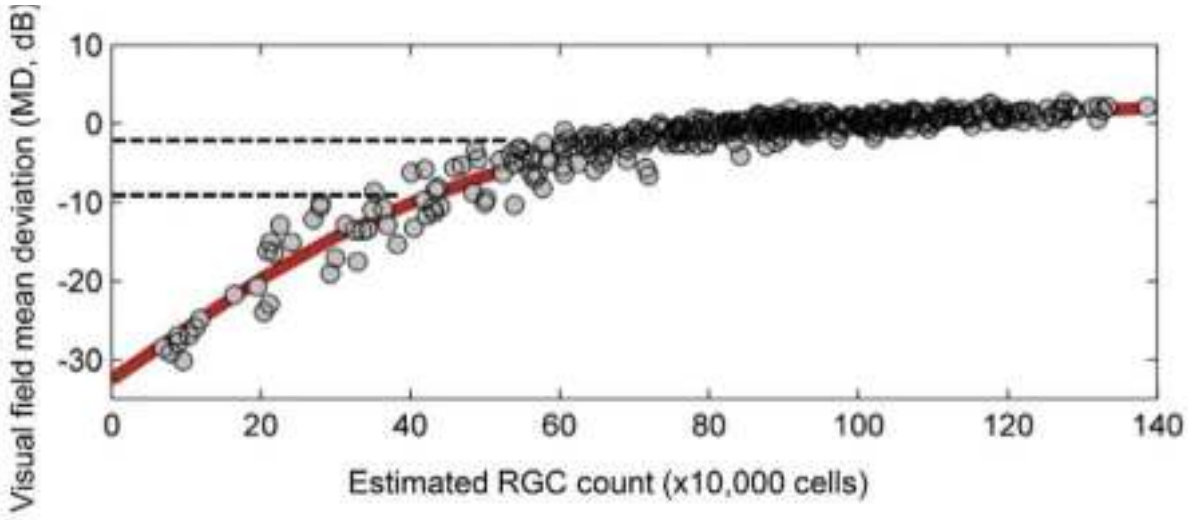


- Advanced glaucoma in a patient's right eye.
- The visual field shows almost complete loss of her inferior hemifield (A).
- The thickness of the corresponding spectral domain optical coherence tomography Superior retinal nerve fiber layer (SD-OCT RNFL) has reached a floor at approximately 40 to 50 µm.
- Note that her inferior RNFL can still be monitored by SD-OCT (B).

Imaging Devices

- **Not likely very helpful**
- **GC assessment**



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VISUAL FIELDS

- **Might be the only possible way to F/U**
- The standard 24-2 visual fields may no longer be very sensitive to subtle progression.
- The standard 24-2 visual fields will miss defects that develop or progress between the 6° spacing of the test points.
- The peripheral field areas might already be gone, and too much time will be wasted waiting for the patient to see a stimulus.
- For patients with advanced visual field loss, the visual fields may be more highly variable, particularly at the borders of existing defects.
- Repeat testing to confirm changes is recommended

Visual Field Changes

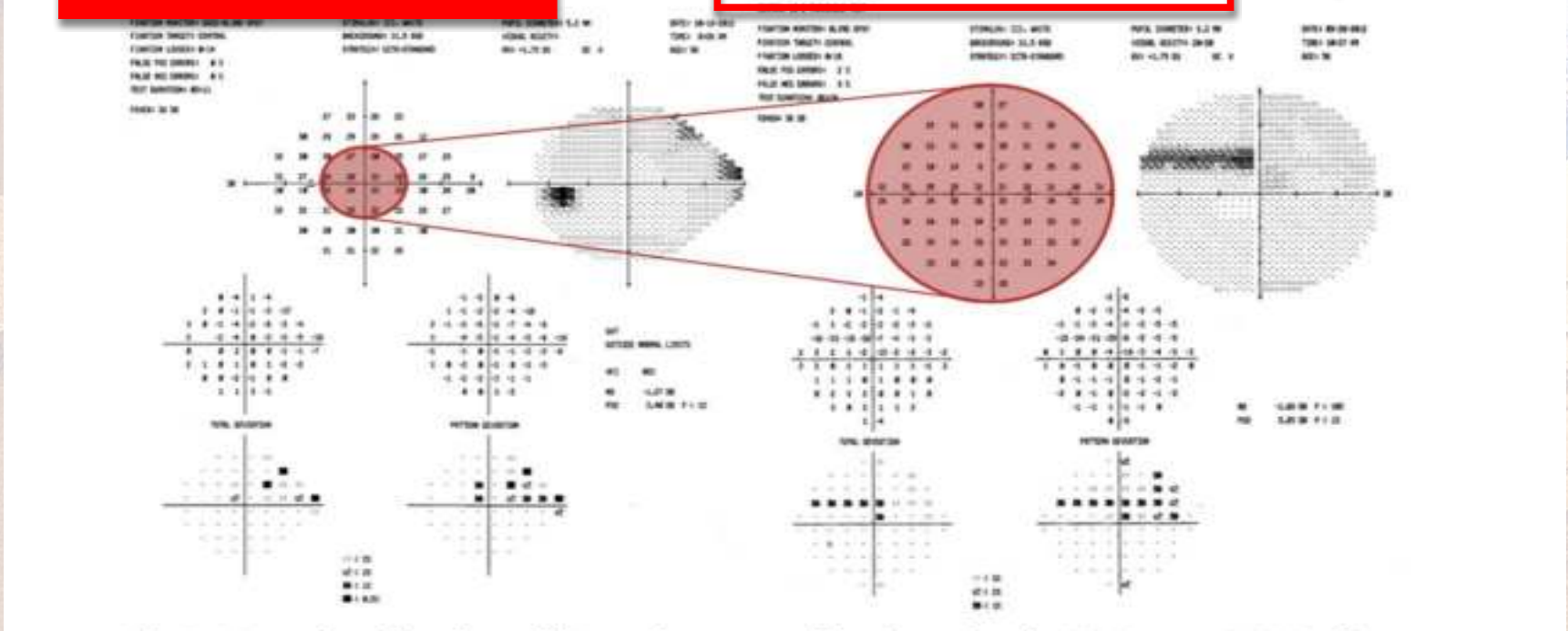
- Standard 24-2 visual fields may no longer be very sensitive to subtle progression

- Resort to examine central 10°- Degrees
- Use Goldman size V instead of III
- Examine the cardinal points around fixation
- Use Quadrant total sensitivity

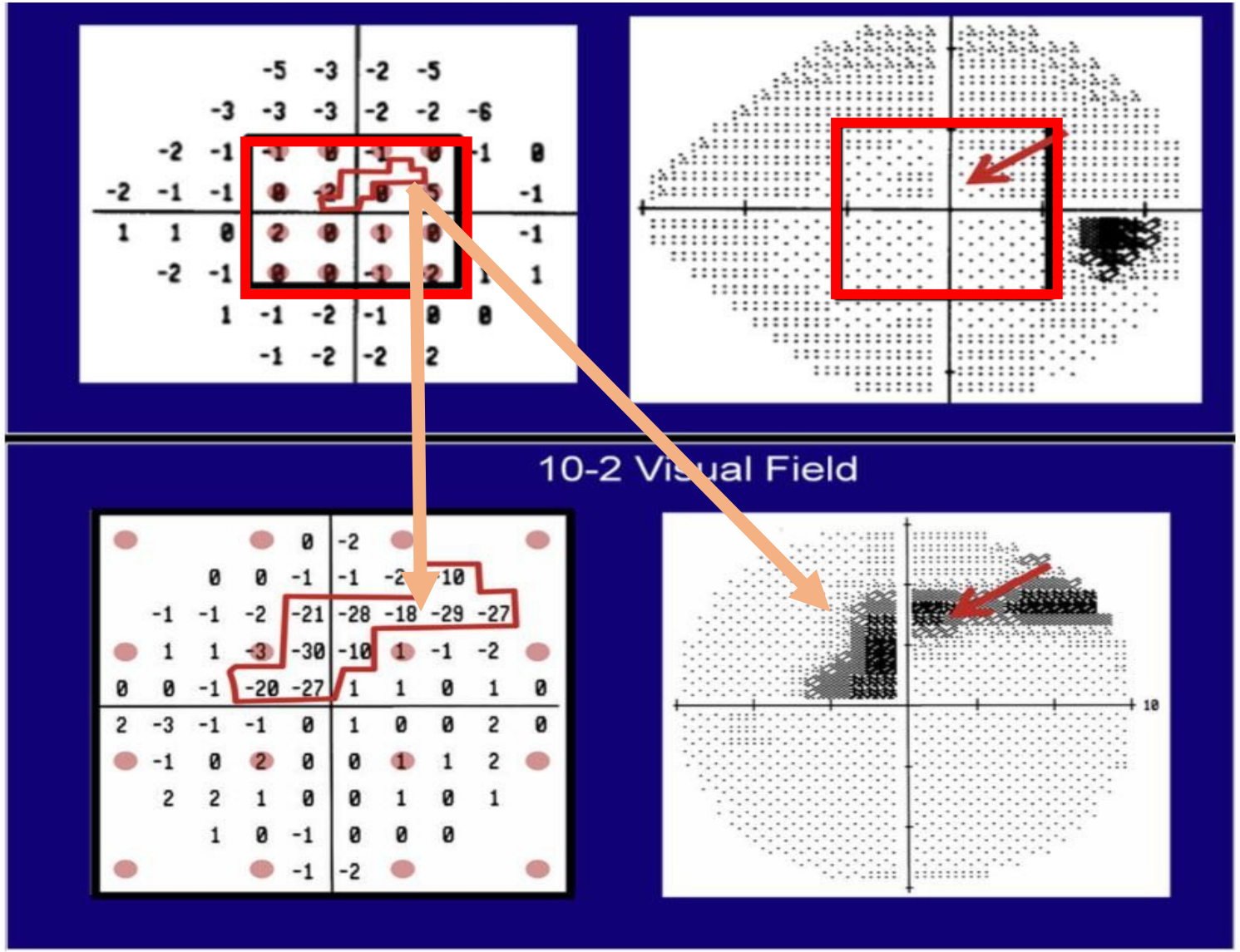
Visual Field Changes

A
24-2 SITA
12 points
6° distance between points

B
10-2 SITA
68 points
2° distance between points



- Might be the only possible way to F/U
- Central 10° Degrees



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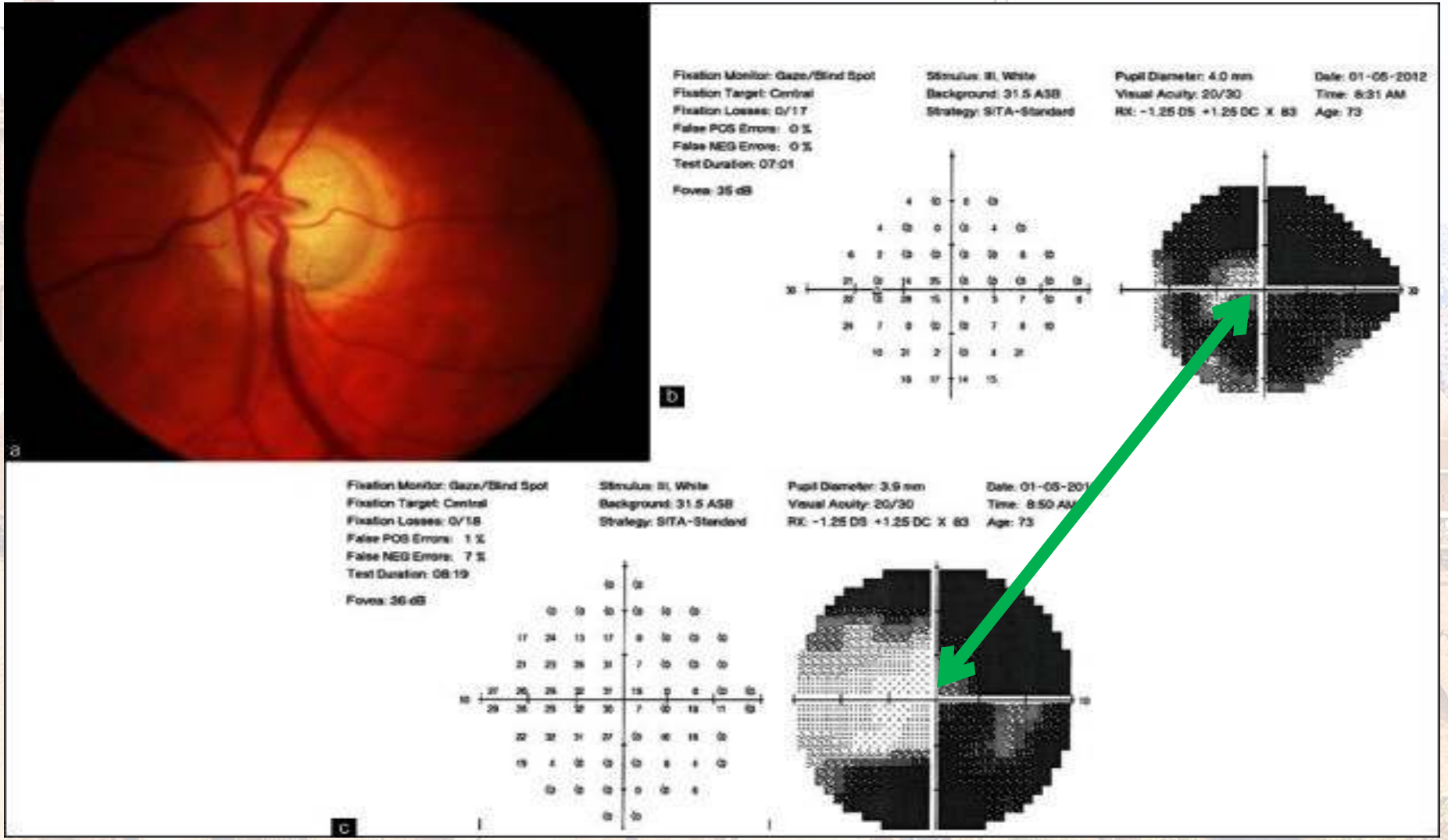

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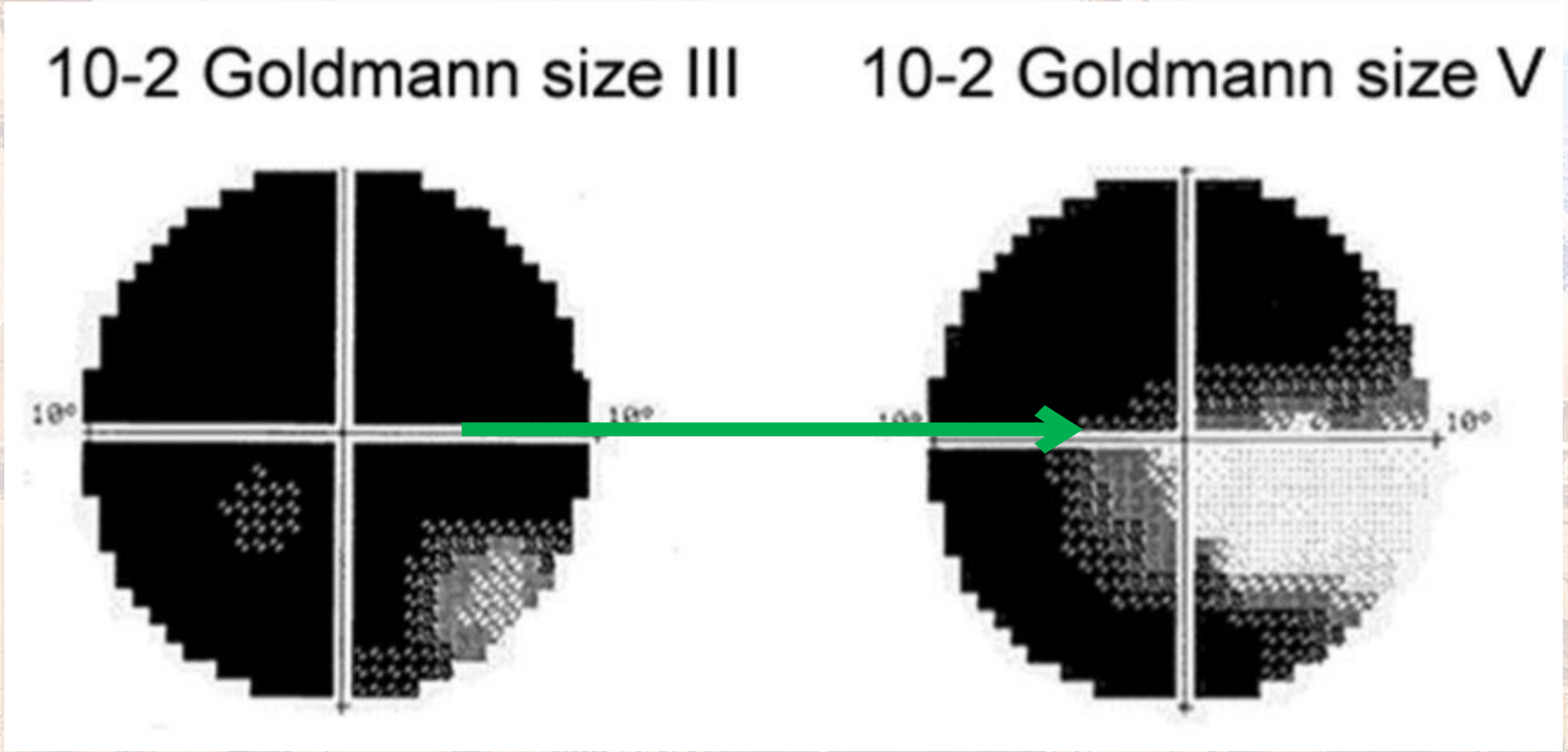
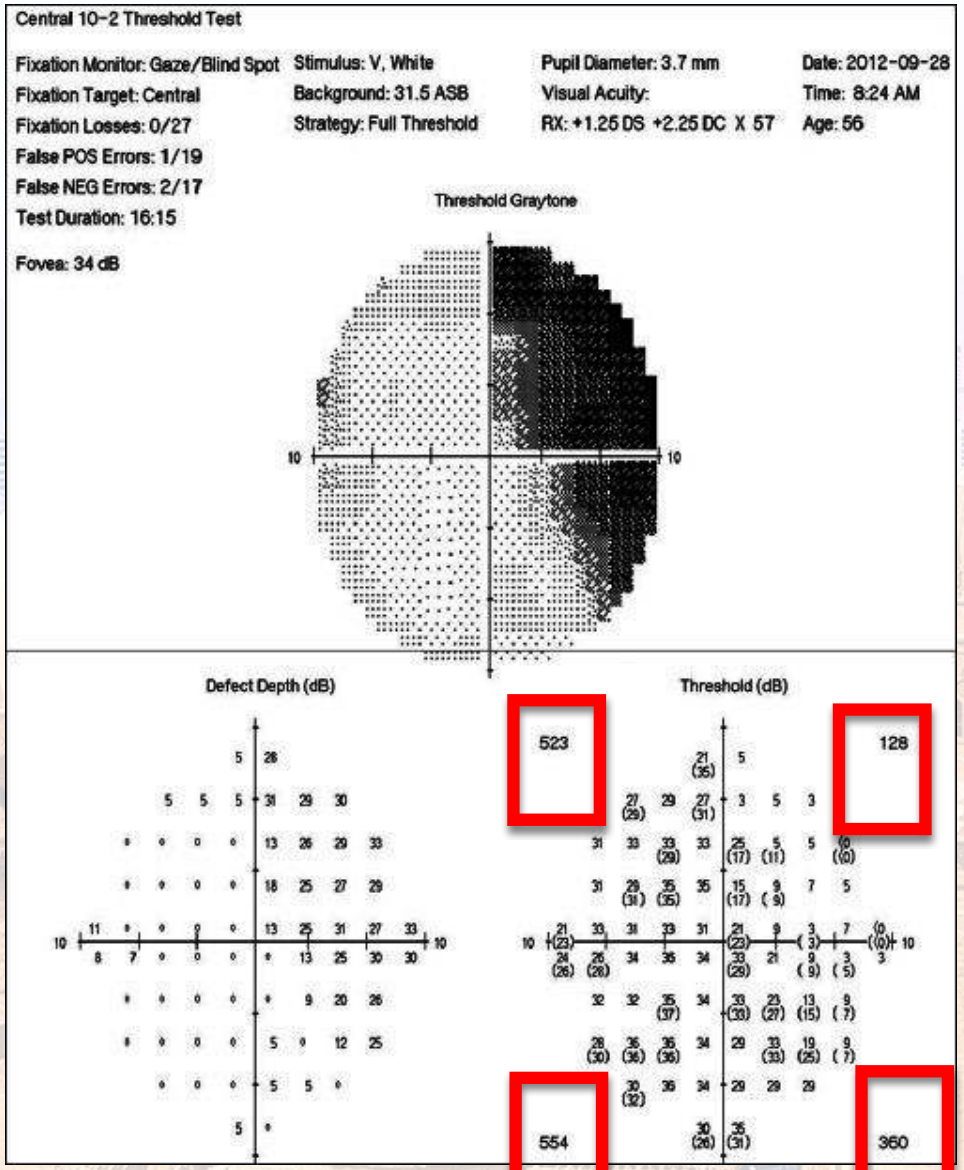
Visual Field Changes



- **Use Goldman size V instead of III**



- Central 10-2 HVF in a patient with advanced glaucoma . The field was generated with a SITA standard method using a size V stimulus. Note quadrant totals on the bottom right hand portion which can be used to monitor sequential fields for progression

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