

IF A PHYSICIAN HAS FOUR CONSECUTIVE VISUAL FIELDS DURING 2 YEARS AND IS LOOKING FOR THE FIRST SIGN OF VISUAL FIELD DAMAGE, IS HE OR SHE BETTER OFF USING A LINEAR REGRESSION ANALYSIS OR A GUIDED PROGRESSION ANALYSIS-TYPE END POINT?

Ideally, both should be used when available. Pointwise linear regression available in the Progressor (Medisoft Ltd, Leeds, United Kingdom) and PeriData softwares is more sensitive for combined focal and diffuse change (as it uses the raw sensitivity estimates), and the guided progression analysis (GPA) compensates for any diffuse change. Clinicians relying on GPA only, however, are unlikely to miss clinically significant progression if they pay careful attention to the point-by-point plots. They should beware of progression near fixation. Clinically significant changes in this region can

be underrepresented by the coarse spacing of test locations. Clinicians must remember that three locations need to be changing sequentially for the GPA to warn of “likely change” or “probable change.”¹⁰

DOES THE REDUCED REDUNDANCY THEORY OF GLAUCOMATOUS DAMAGE HAVE ANYTHING TO DO WITH THE NUMBER OF FIELDS NEEDED TO DIAGNOSE EARLY GLAUCOMA?

The concept of reduced redundancy has been introduced to account for the differences in performance (sensitivity, specificity, and other statistical measures) among various forms of visual field testing, detecting the earliest signs of functional damage, and assessing the potential mechanisms of glaucomatous loss. The number of visual fields needed to diagnose early glaucoma depends on the reliability and long-term variabil-

Gleaning the Fields of the Ocular Hypertension Treatment Study

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1. The earliest visual field defect in a patient with ocular hypertension who converts to primary open-angle glaucoma (POAG) is usually a combined form of localized and diffuse loss. It is uncommon to see only one type early on. This is important, because many ophthalmologists may only be looking for a classic arcuate defect and that would not be in the best interest of the patient with ocular hypertension. Even though arcuate defects are the hallmark of glaucoma, the Ocular Hypertension Treatment Study (OHTS) demonstrated that early on, a diffuse loss may accompany the arcuate defect or potentially diffuse loss may occur by itself in early disease.¹

2. Localized- or arcuate-type change is best picked up by evaluating the total- and pattern-deviation plots.

3. Diffuse change is best detected by checking the mean deviation.

4. In more than 50% of patients in OHTS who developed glaucoma, the optic nerve worsened while the visual field remained normal. If you are relying mainly on the classic arcuate visual field defect to diagnose POAG, the horse is well out of the barn.

5. If you see a mild generalized loss of sensitivity in a patient with ocular hypertension, it may be the first sign of

field damage. Repeat the field and re-evaluate the disc. We clinicians can no longer simply attribute generalized field loss to a nonspecific event; it could be a sign of early POAG.

6. Until we learn more, it is best to examine both longitudinal and cross-sectional visual field analyses to determine if there is a true change in sensitivity.

7. In an ocular hypertensive patient similar to those in the OHTS with initially normal visual fields, even after two reliable abnormal visual fields in a row, the next visual field was normal 36% of the time. After one abnormal visual field the next visual field was normal 85.9% of the time. However, after three abnormal visual fields, the next visual field was normal only 12% of the time. Visual fields need to be repeated several times to be sure of a definitive glaucomatous defect. Obviously, the visual field should be correlated with the disc at every visit to obtain a more meaningful picture of the overall glaucomatous process.

1. Kass MA, Heuer DK, Higginbotham EJ, et al. The Ocular Hypertension Treatment Study—a randomized trial determines that topical ocular hypotensive medication delays or prevents the onset of primary open-angle glaucoma. *Arch Ophthalmol.* 2002;120(6):701-713.