

Perimetry in Advanced Glaucoma

By

Prof. Dr. Mohamed Saad

Alexandria University

Egypt

What is Advanced Glaucoma?

The staging system most frequently used in glaucoma clinical trials is the Hodapp-Parish-Anderson (HPA) glaucoma classification which classifies damage based on two criteria:

- The mean deviation value (MD)
- The number of defective points in the Humphrey statpac-2 pattern deviation probability map of the 30-2 full threshold test and the defect proximity to fixation point

Criteria for Glaucomatous Loss

Early stage:

- $MD > 3 < 6$ dB
- Fewer than 15 points affected with $p < 5\%$ and fewer than 8 points below $p < 1\%$ level

January 02 - Page 3

Criteria for Glaucomatous Loss

Moderate :

- $MD > 6 < 12$ dB
- Fewer than 30 points affected with $p < 5\%$ and fewer than 15 points below $p < 1\%$ level

January 02 - Page 4

Criteria for Glaucomatous Loss

Advanced :

- MD > 12dB
- More than 30 points affected with $p < 5\%$ and more than 15 points below $p < 1\%$ level

January 02 - Page 5

Early Glaucoma

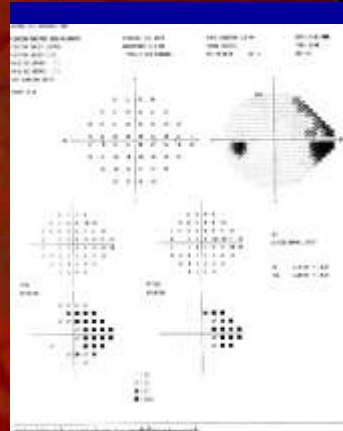
EMGT: IOP reduction
of 25%

45% of patients progress

CIGTS: IOP reduction
from 35% to 48%

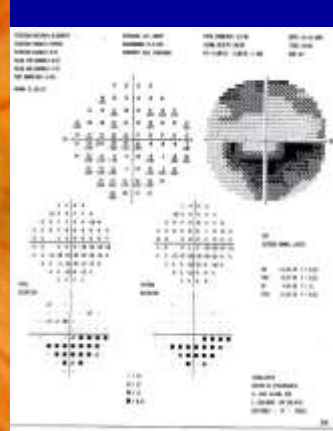
(target IOP)

No progression



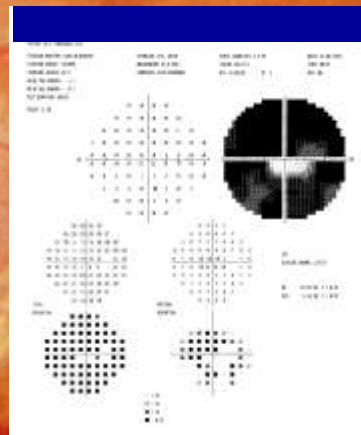
Moderate Glaucoma

IOP <17 mm Hg
No progression

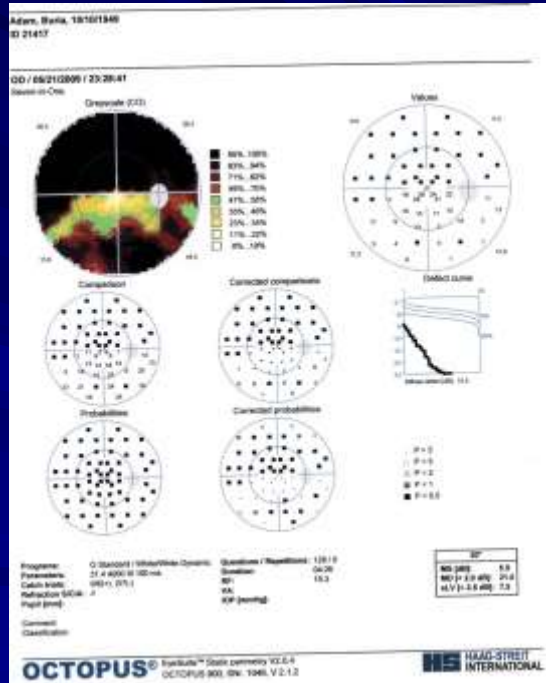
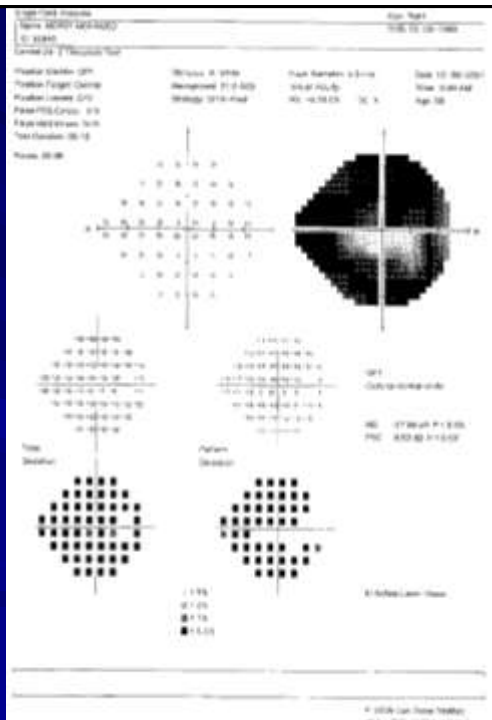


Advanced Glaucoma

AGIS: Mean IOP of 12.3 mmHg
and IOP always <18 mmHg
No progression



Advanced Glaucoma



Perimetry in Advanced Glaucoma

- **Careful visual field testing and follow up are important in advanced glaucoma**
- **The visual field is the best method to measure progression over time esp. in advanced glaucoma where the optic disc damage is great with only small residual tissue to follow progression in it**
- **For patients who have lost the vast majority of visual function, the central island may represent the last hope**

Perimetry in Advanced Glaucoma

- **It is very important that the choice of the test program and strategy is tailored to the patient condition , no matter what machine one uses**
- **To do this effectively, it is important that the examiner is aware of the capability of the machine that is being used.**

Perimetry in Advanced Glaucoma

The choice of program or strategy in advanced glaucoma may include:

- The central 10-2 program or M program
- The peripheral semi-automated kinetic program
- The Low Vision Program (LVP)

10-2 program for tubular field

MACULA PATTERN FOR ADVANCED GLAUCOMA

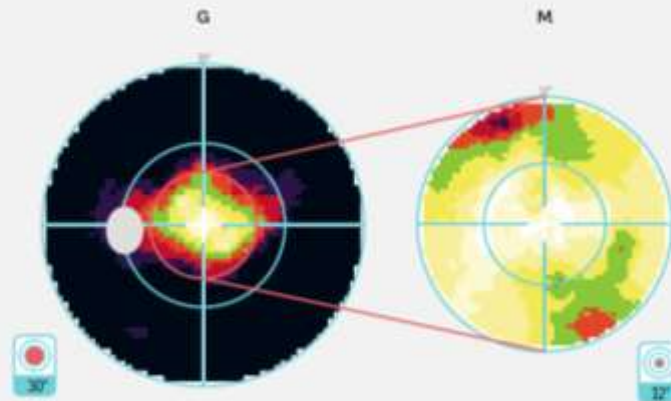


FIGURE 5-5 In advanced glaucoma with a severely constricted visual field, the focus of visual field testing is on the remaining vision in the macula. In these situations, a macula pattern like the M pattern provides more clinically relevant information than a central pattern such as the G pattern.

Kinetic perimetry is faster in advanced glaucoma

SLOW PERIPHERAL TESTING WITH STATIC PERIMETRY

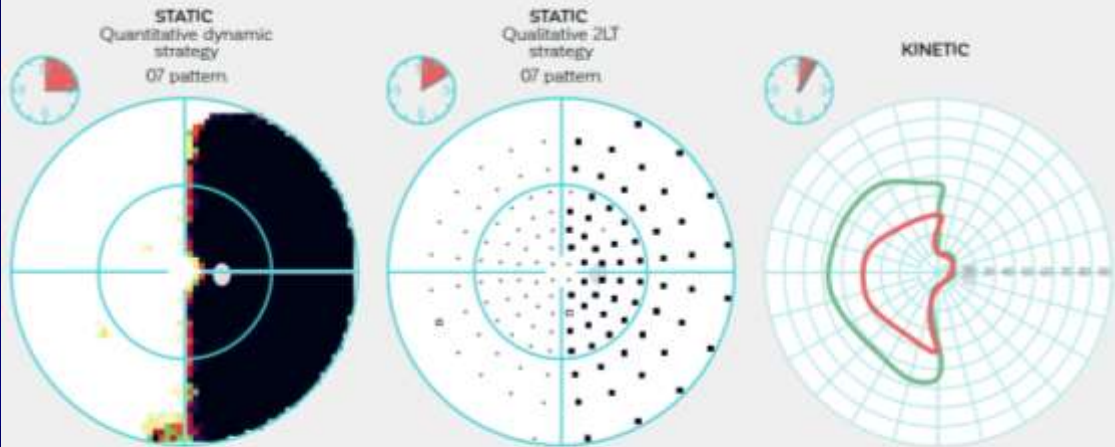
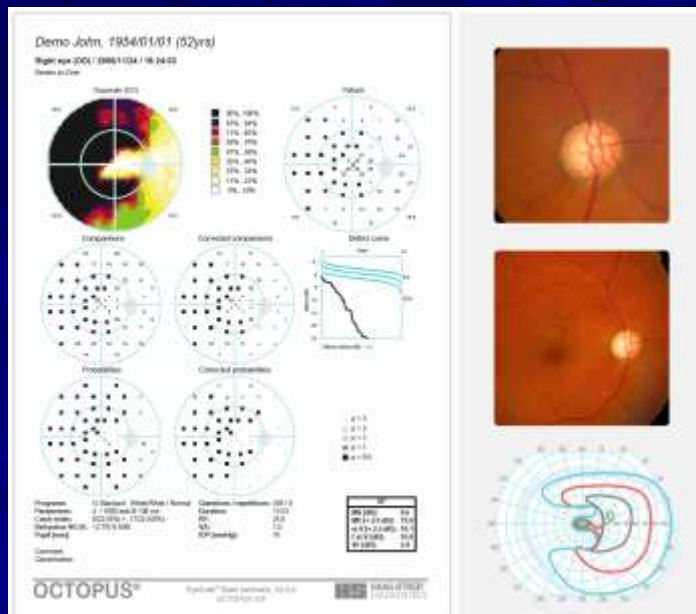
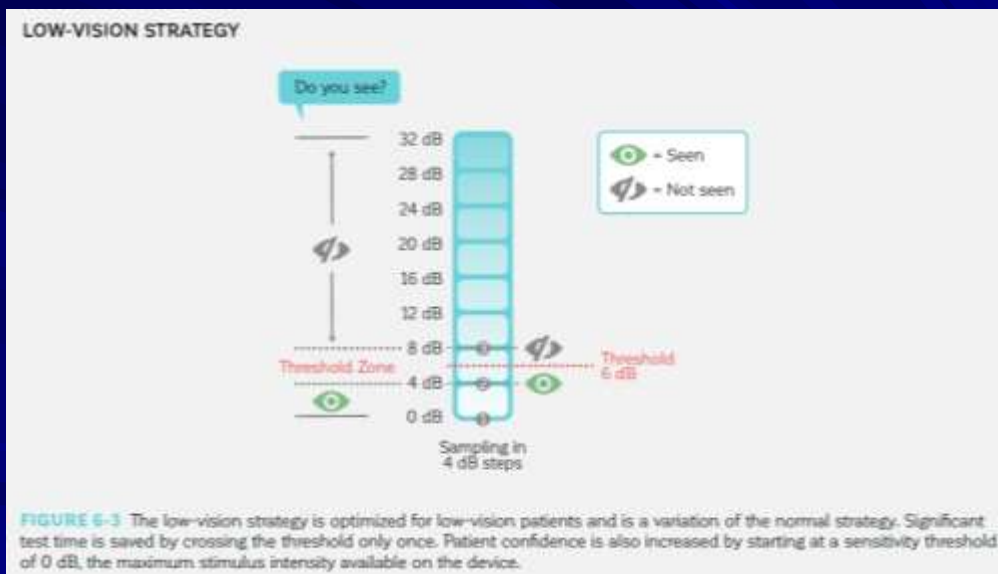


FIGURE 11-2 Peripheral testing with static perimetry is time-consuming under both quantitative and qualitative strategies, as this example of a postchiasmal lesion resulting in hemianopia with macular sparing demonstrates. Note that a kinetic test can be up to three times faster than a quantitative static test.

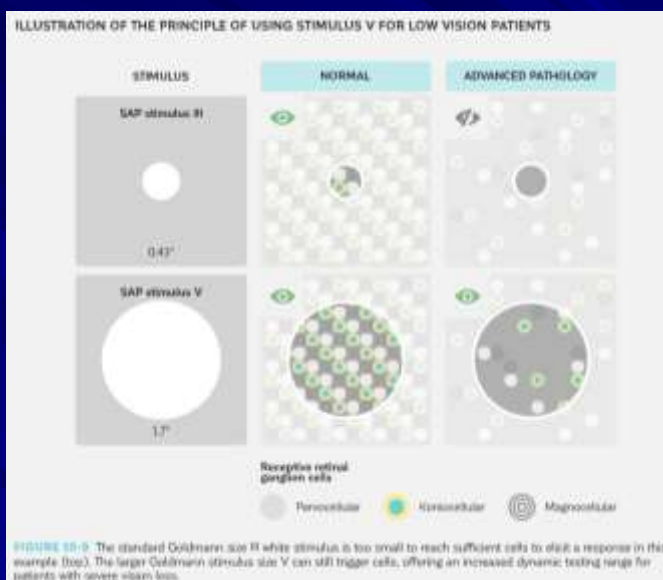
Kinetic perimetry in advanced glaucoma



Low vision strategy in advanced glaucoma



Low vision strategy in advanced glaucoma



Low vision strategy in advanced glaucoma

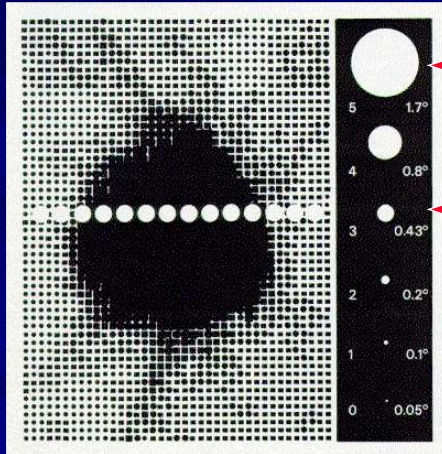
CHARACTERISTICS OF THE TOP, DYNAMIC, LOW VISION AND NORMAL STRATEGIES				TABLE 6-2
	TOP	DYNAMIC	LOW VISION	NORMAL
TEST DURATION*	2-4 minutes	6-8 minutes	6-8 minutes	10-12 minutes
WHAT IT IS BEST AT DETECTING	Contiguous defects (central 30°)	Contiguous defects Isolated defects Peripheral defects Mild sensitivity threshold changes	Contiguous defects Isolated defects Peripheral defects Sensitivity thresholds with low sensitivity	Contiguous defects Isolated defects Peripheral defects Mild sensitivity threshold changes
BEST SUITED FOR	Patients struggling with fatigue Busy practices	Patients with mild changes in sensitivity thresholds Patients with good cooperation and attention	Low vision patients	Patients with excellent cooperation, attention and minimal fatigue
COMMON USES	Glaucoma Macula	Glaucoma Macula Periphery (Neuro, Retina)	Low vision	Clinical research
METHODOLOGY	Spatial relationship among sensitivity thresholds of neighboring zones	Sampling with increasing step size (2-10 dB)	Sampling with 4 dB step size Start at 0 dB sensitivity	Sampling with 4-2-1 dB step size
ACCURACY IN dB	n/a	From ± 1 dB (normal vision) to ± 5 dB (Low vision)	± 2 dB	± 1 dB

*Test duration estimates are provided for the 30° G pattern with 59 test locations.

Low vision strategy in advanced glaucoma

- The size Goldmann V stimulus allows maximum flexibility in testing patients with severely disturbed visual fields
- The size Goldmann III stimulus is recommended for use in most patients because it is small enough to detect even very small scotomata and it is large enough to be relatively unaffected by residual errors of refraction

Stimulus Sizes in relation to the blind spot (Actual OCTOPUS greyscale)

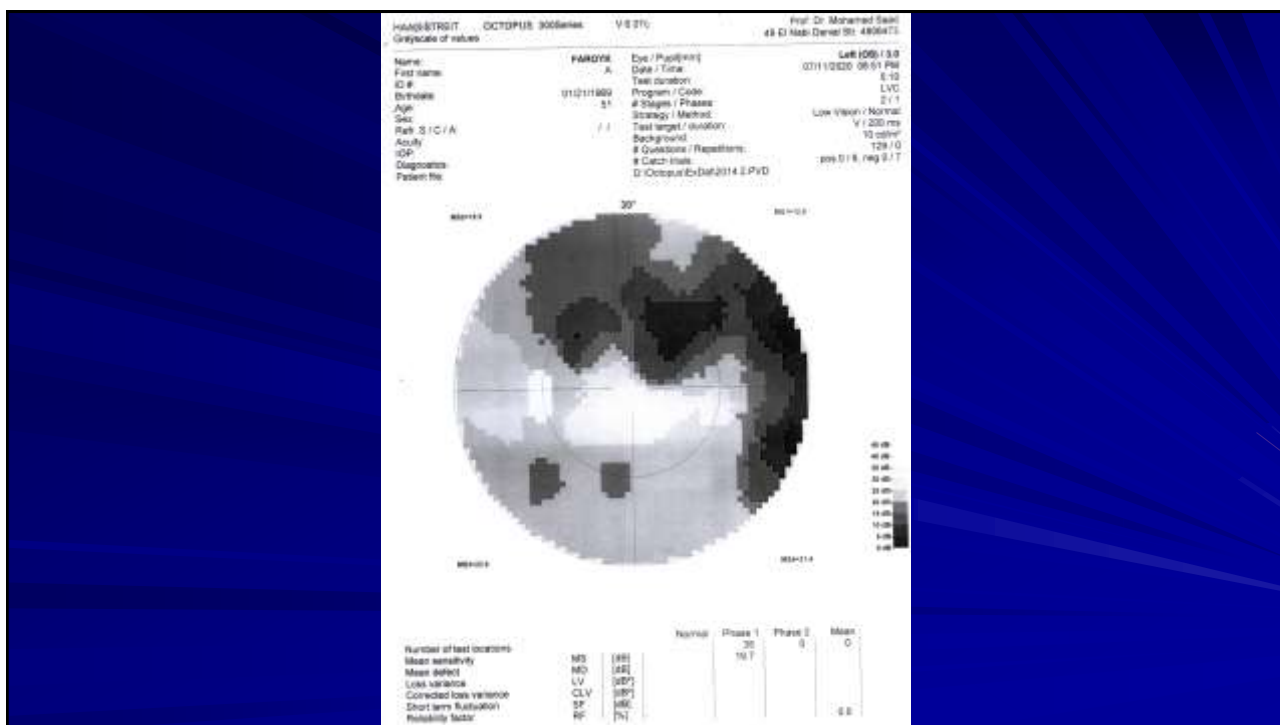
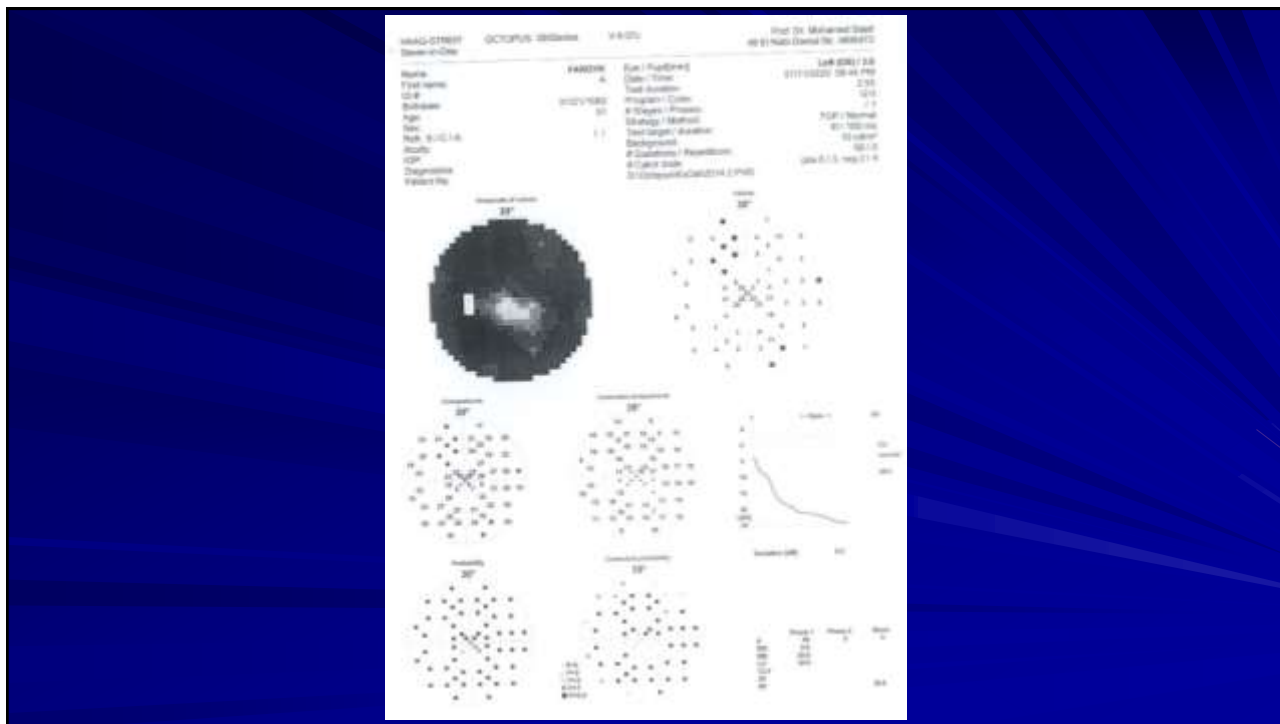


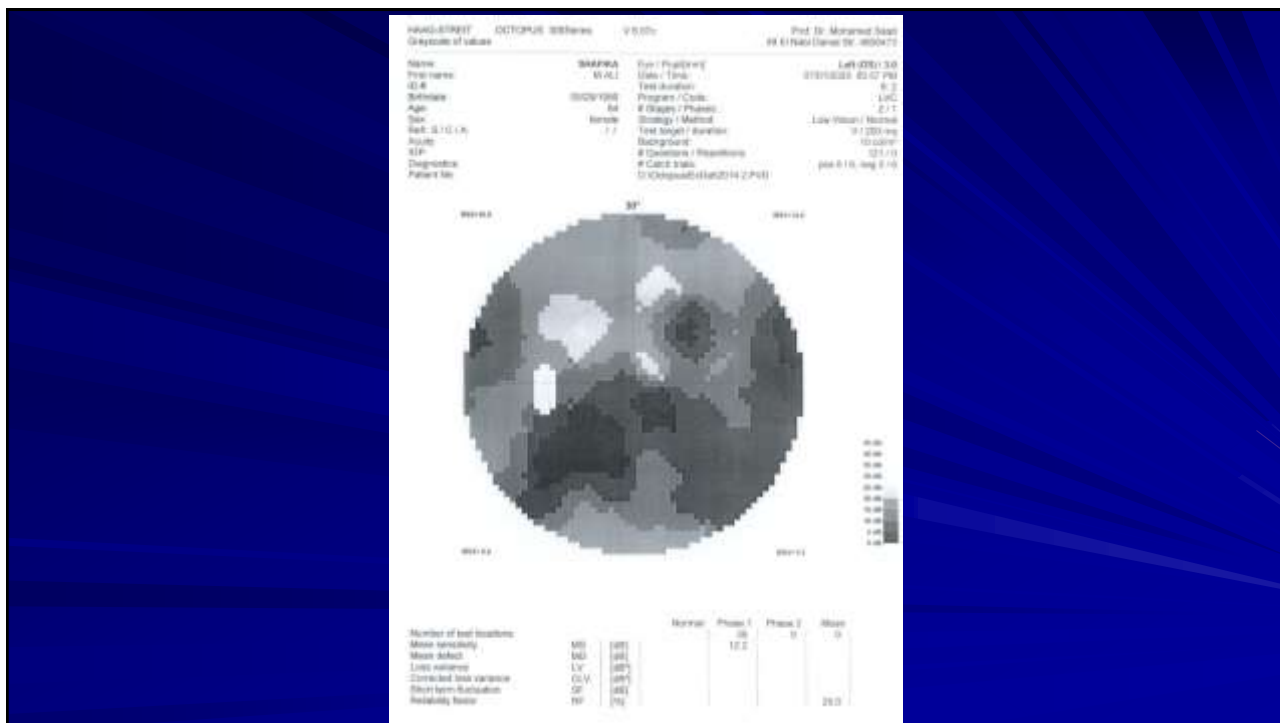
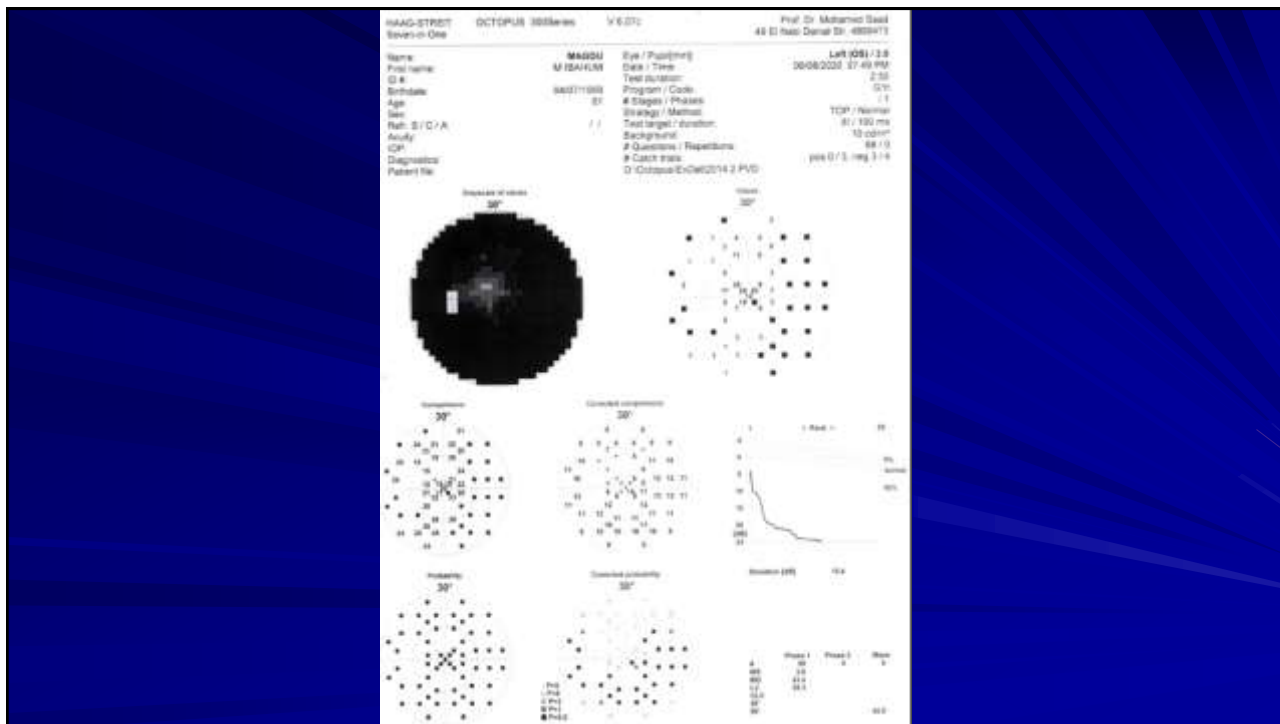
Stimulus size V is used in Low Vision and in Blue-on-Yellow perimetry

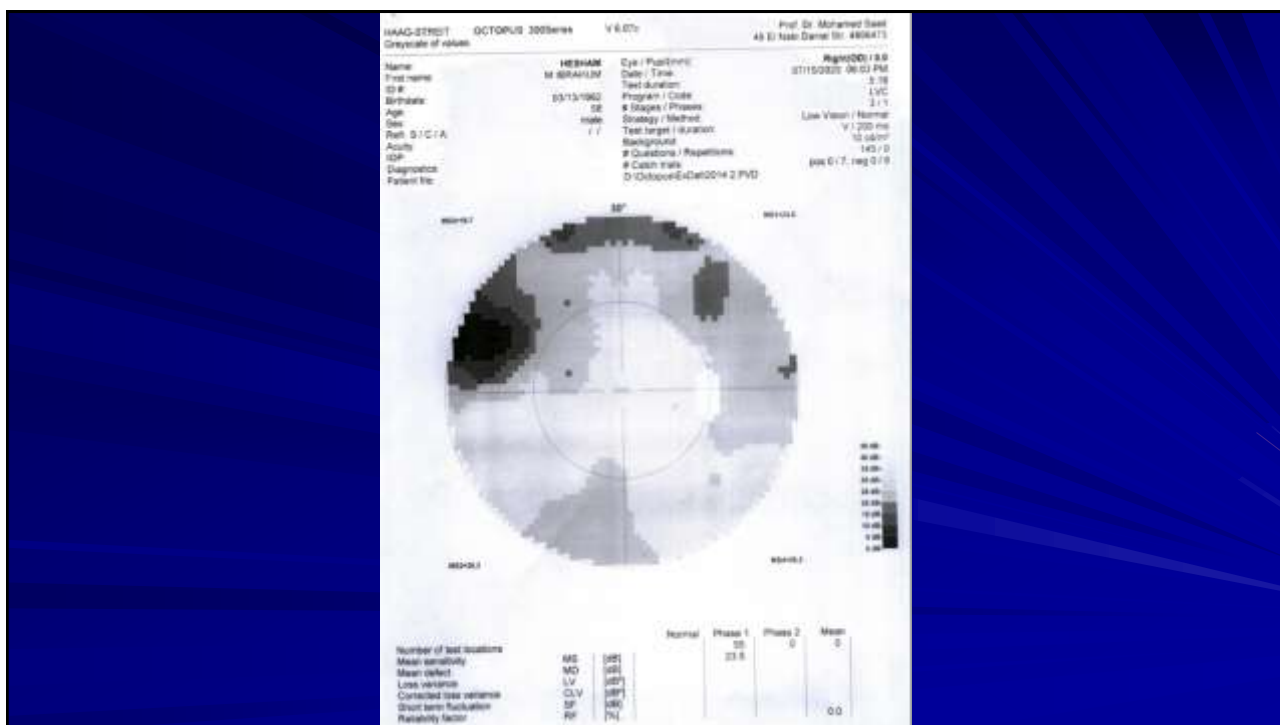
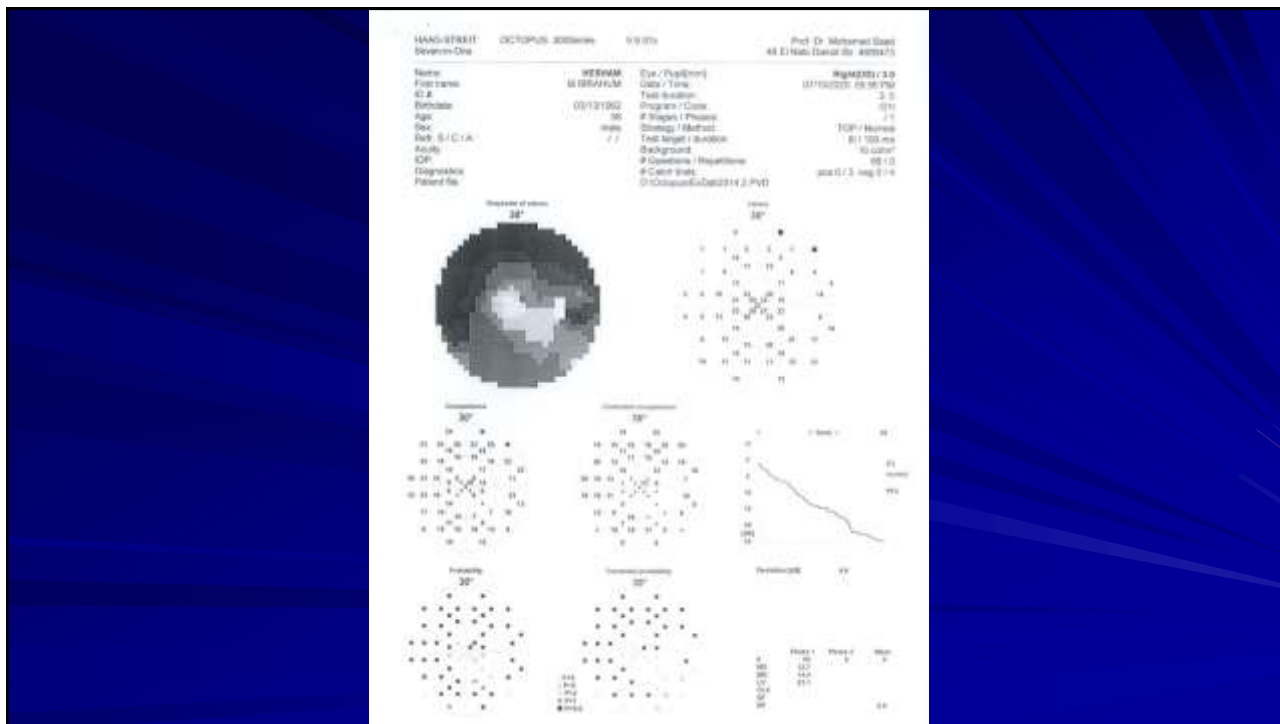
Stimulus size Goldmann III is used in most clinical applications

Low vision strategy in advanced glaucoma

- **A 70 year old patients suffers from advanced glaucoma tested first with size III spot, then by size V spot**
- **Defects that were recorded as absolute with size III were found to be relative when switch to V**
- **Testing with the larger spot size makes it possible to follow highly damaged areas and note any progression**

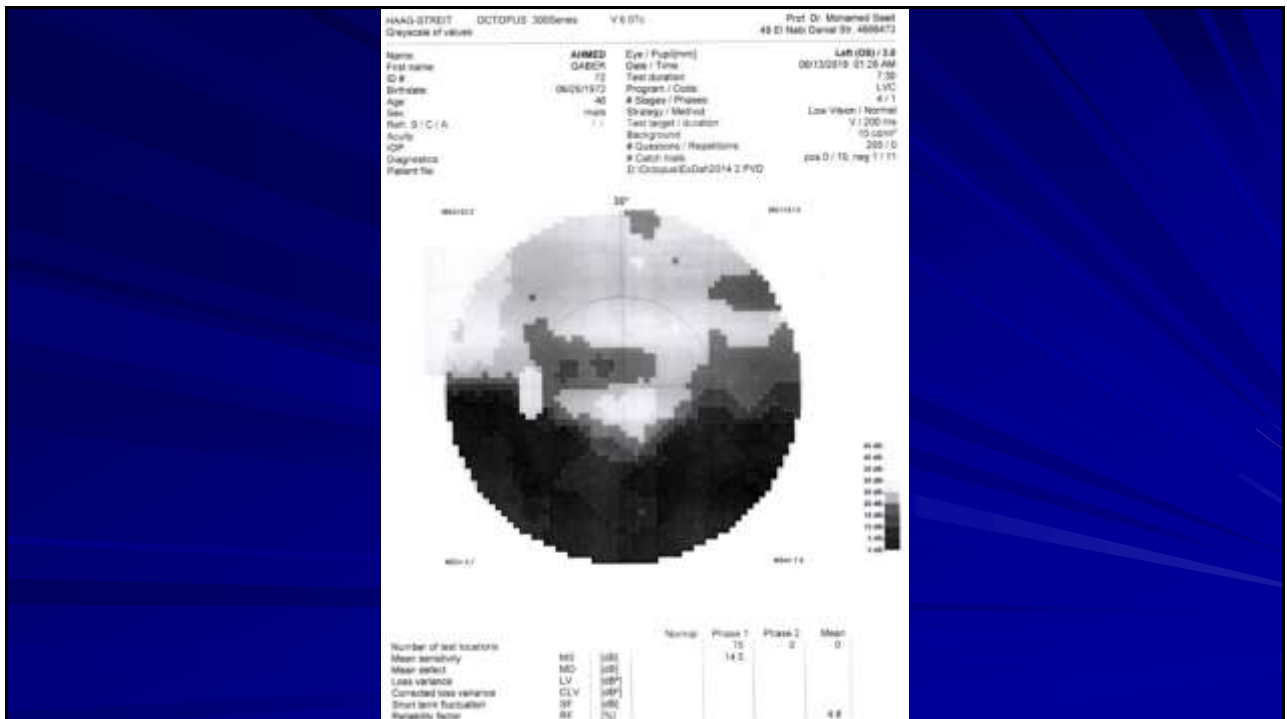


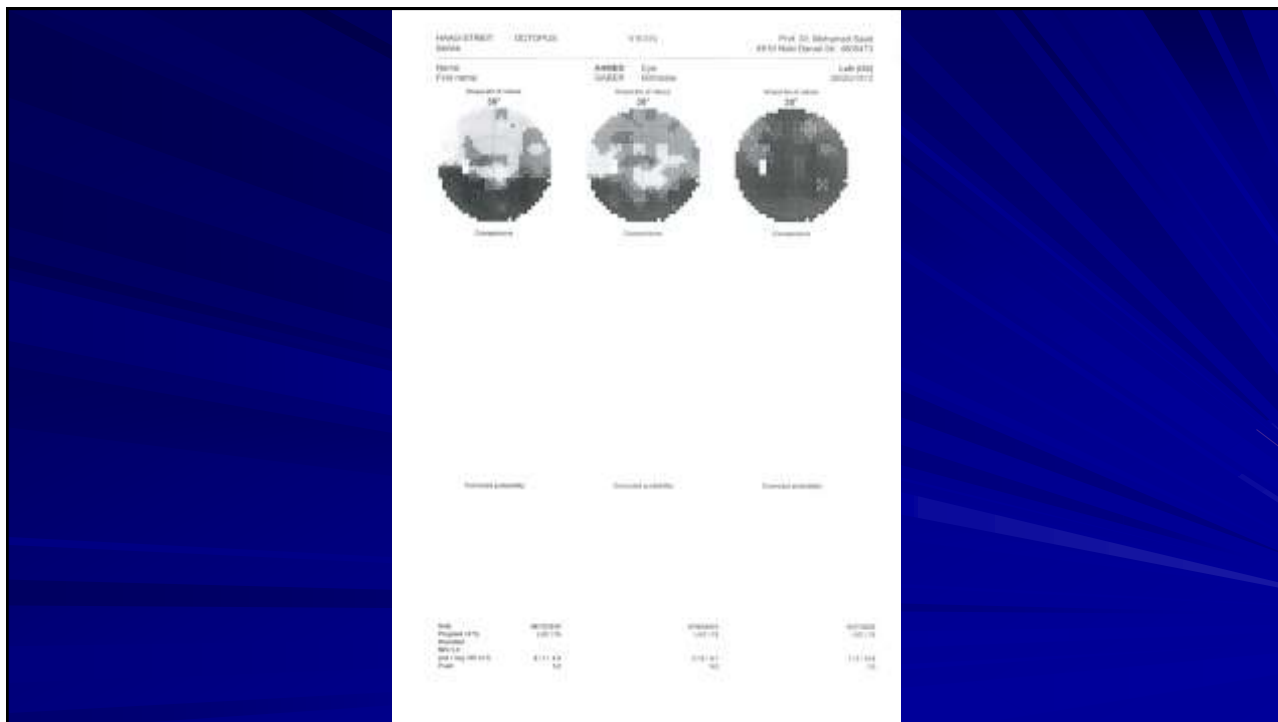




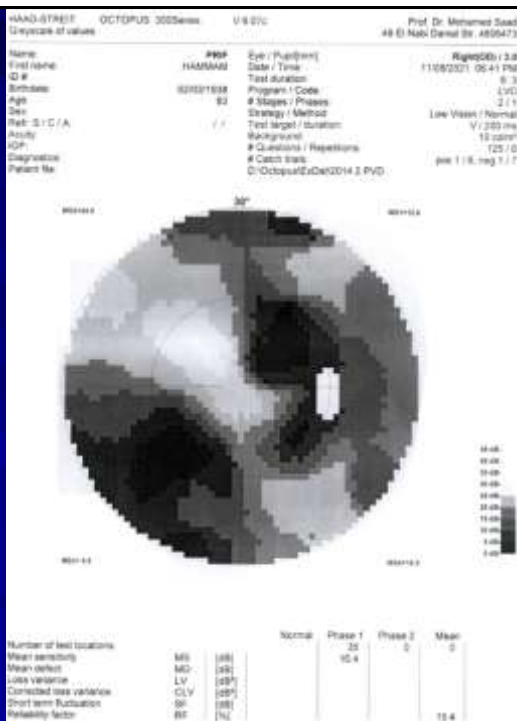
Follow up of Advanced Glaucoma

- A 48 ys male dentist suffered from car accident resulted in badly damaged lt eye with advanced post traumatic glaucoma and very poor visual acuity
- Field of vision with Goldmann size III was impossible, but with LVP, dense inferior arcuate defect was detected and followed up over time
- Recently he was subjected to a tennis ball injury with much worsening of his field

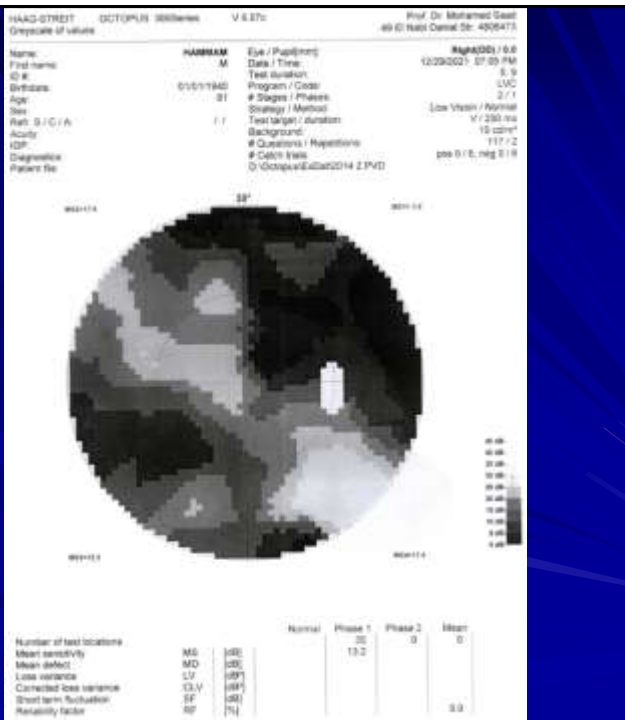




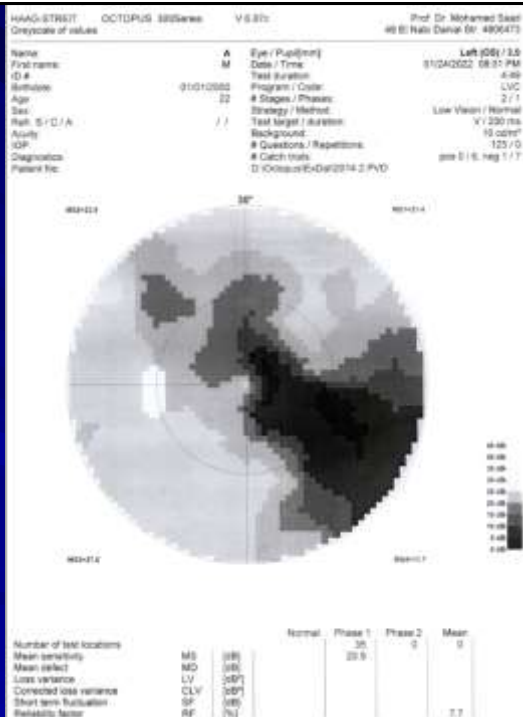
**Non
glaucomatous
optic atrophy**



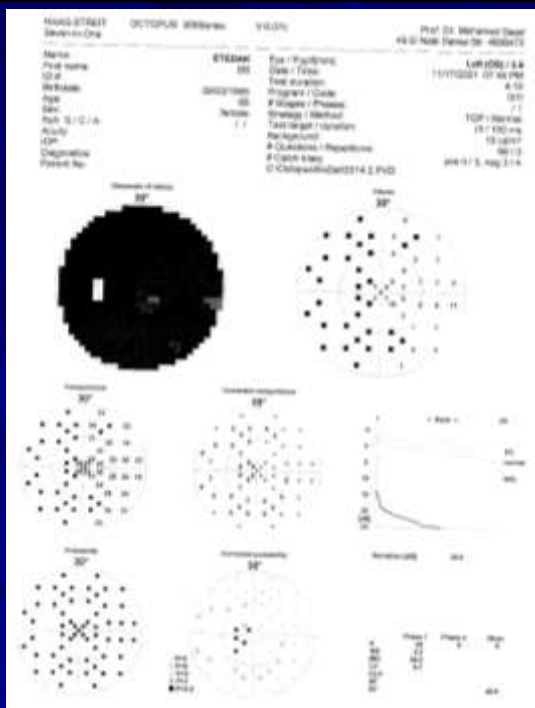
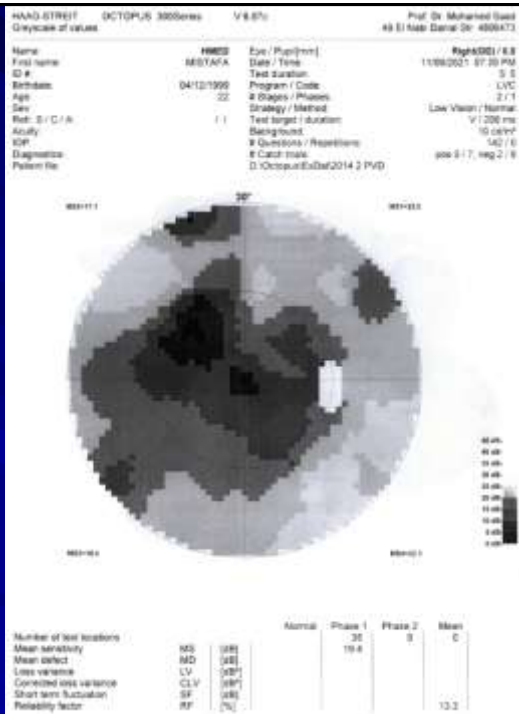
Non glaucomatous optic atrophy

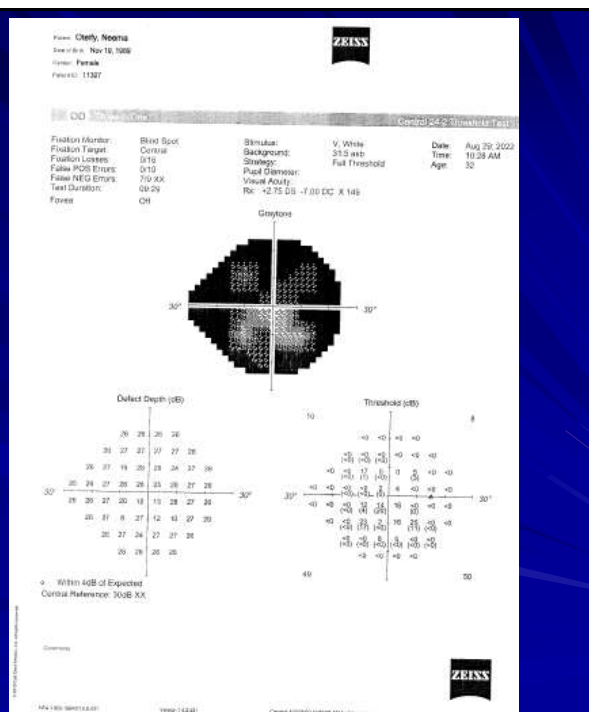
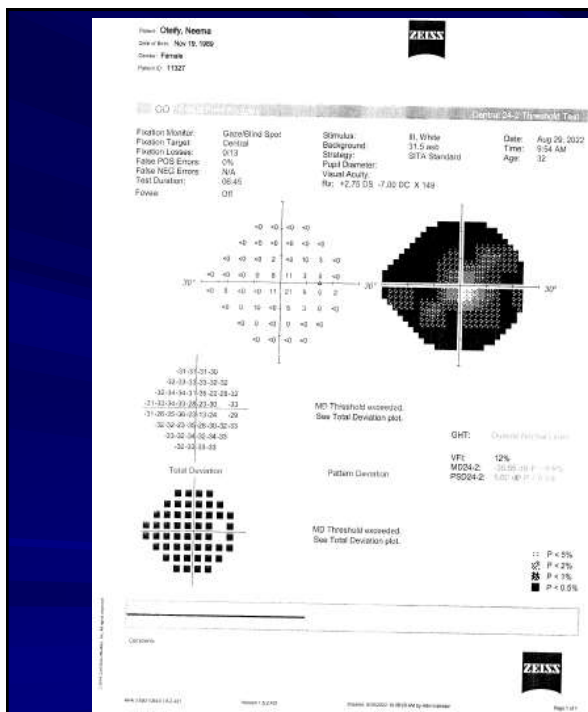
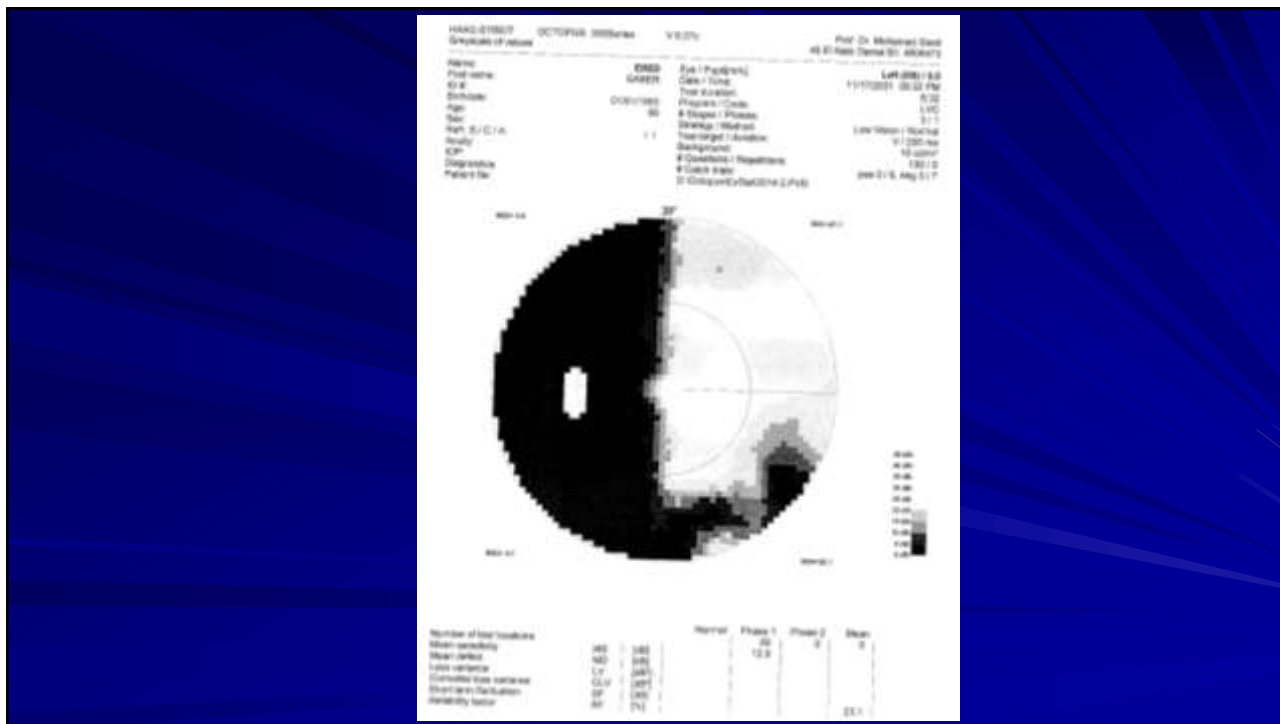


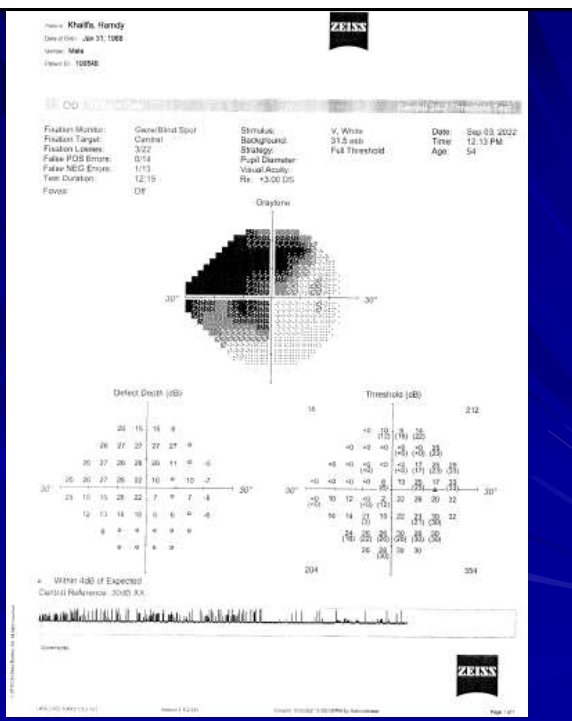
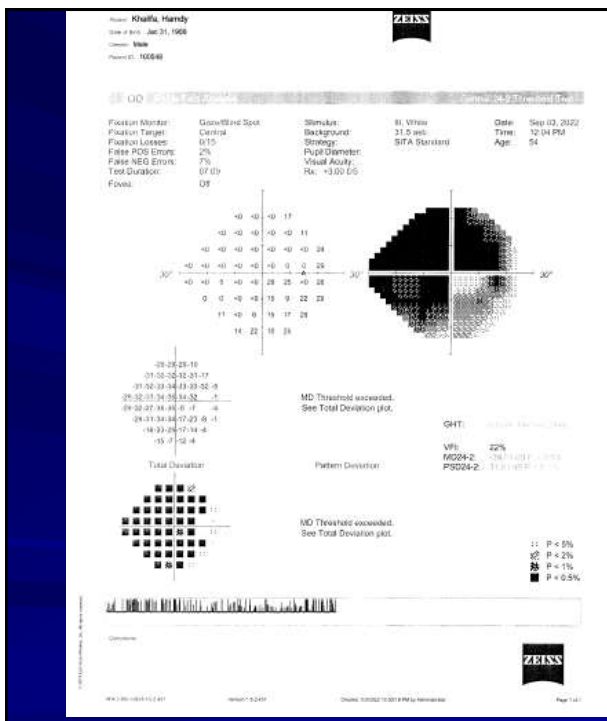
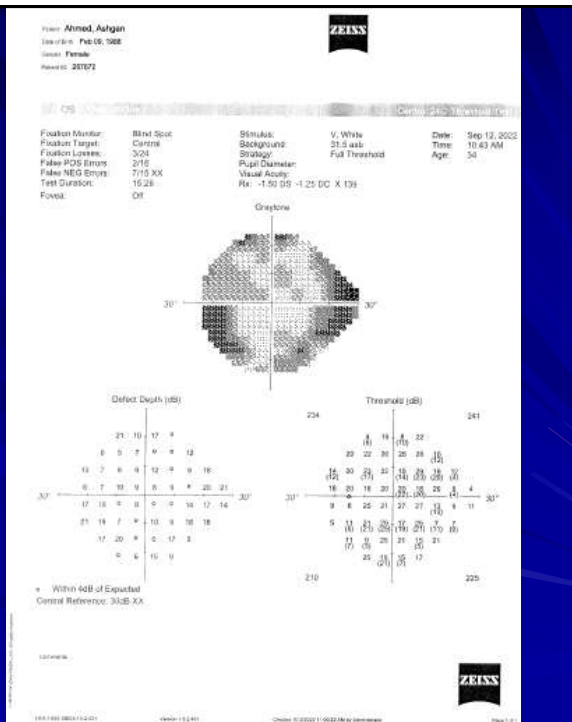
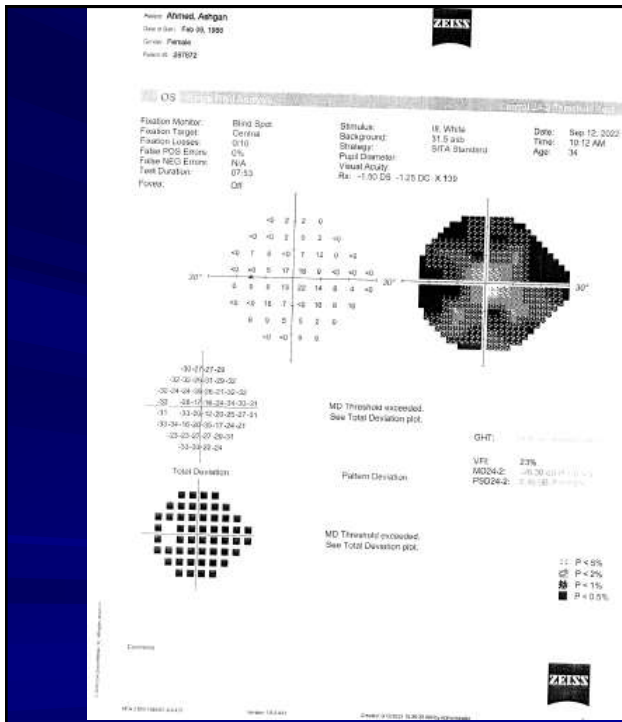
Unexplained loss of vision after lasik

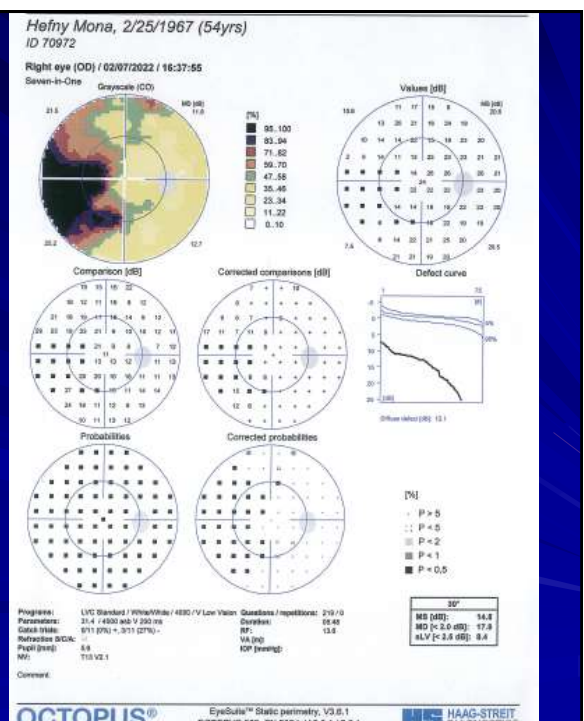
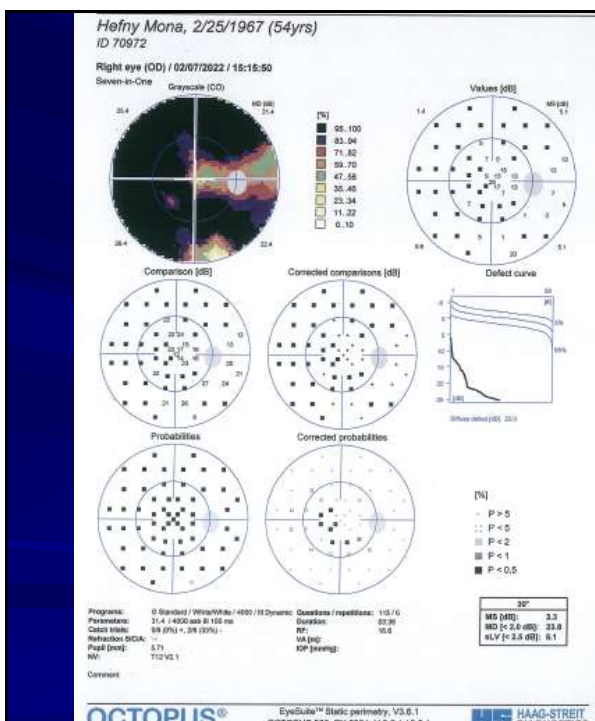
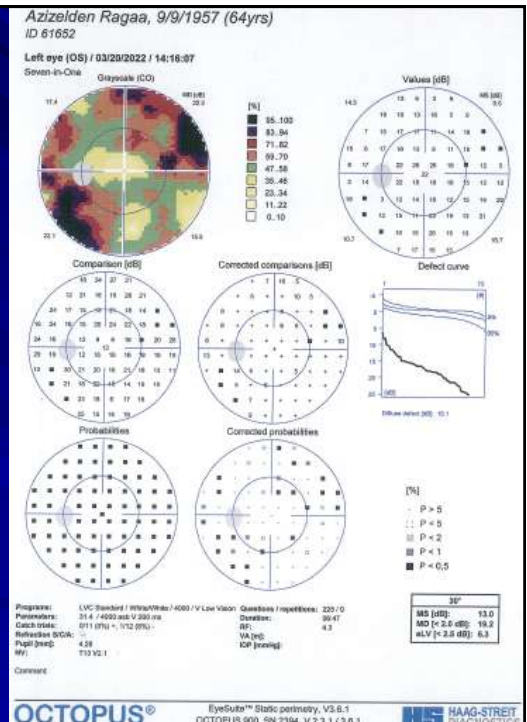
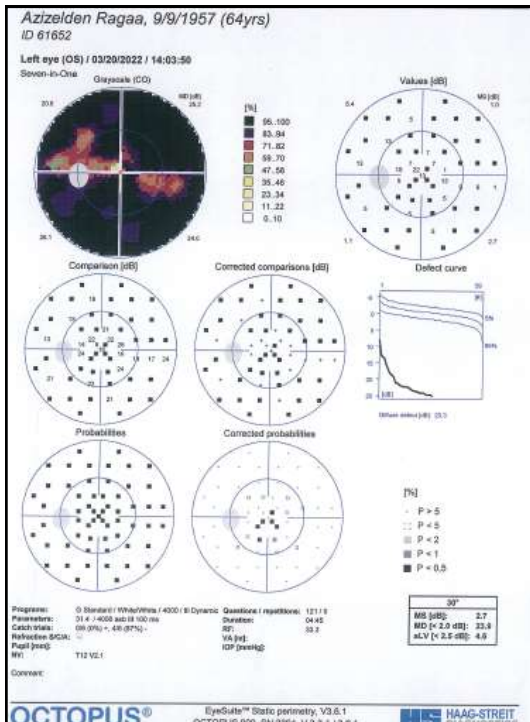


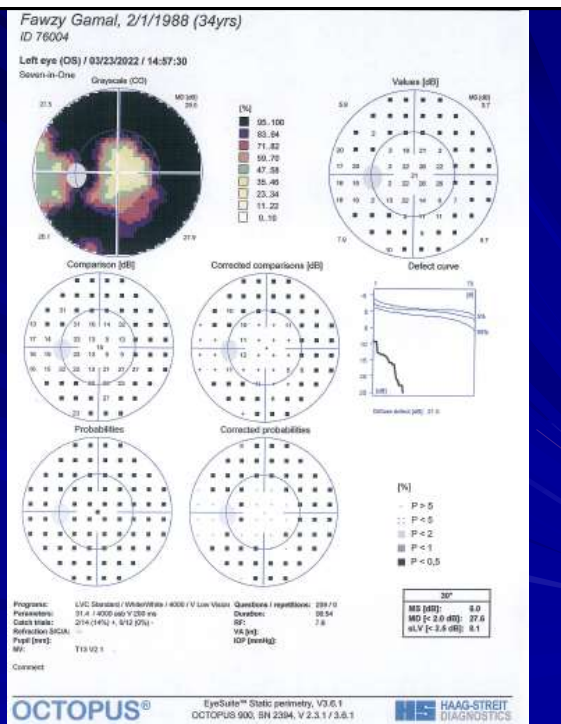
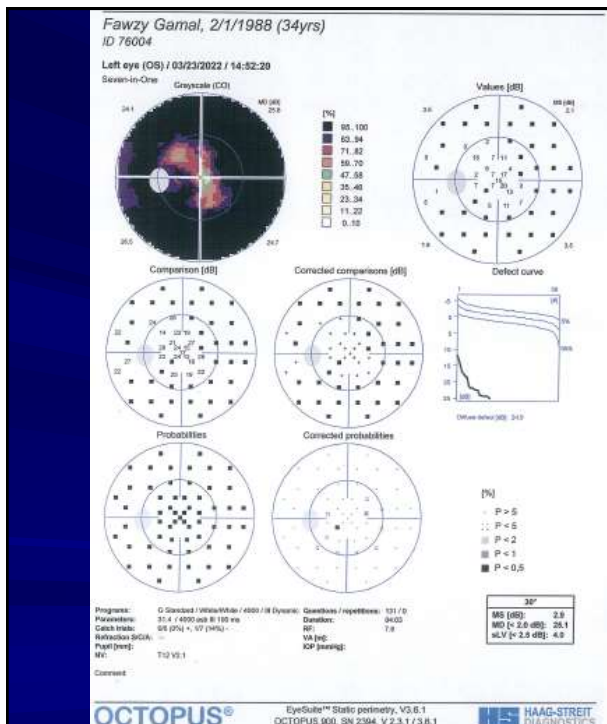
Unexplained loss of vision after lasik











THANK YOU