



# FORUM Glaucoma Workplace from ZEISS

## Clinical Interpretation Guide



We make it visible.

# **ZEISS FORUM Glaucoma Workplace 2.0**

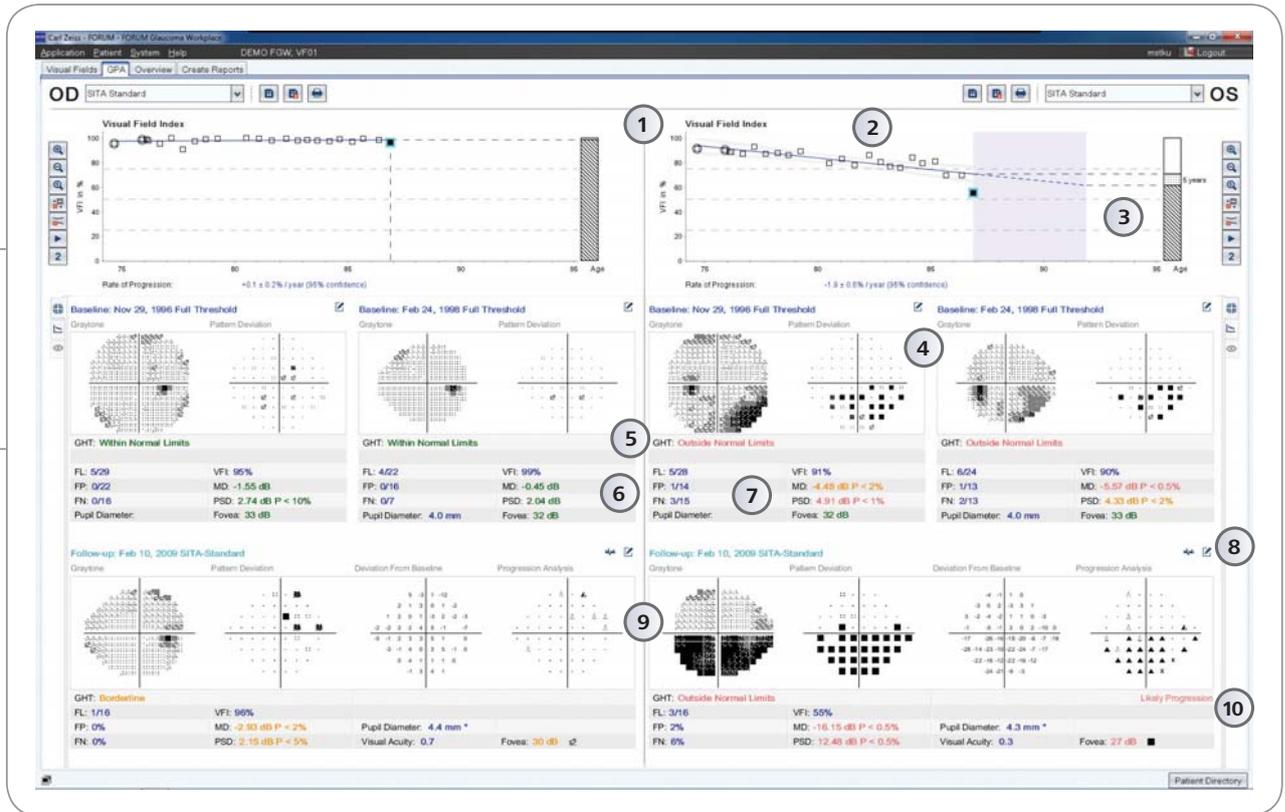
For years, doctors have asked for the operational capability to analyze data from their Humphrey® Field Analyzer (HFA™) using a Mac or PC, right in their office. Based on this feedback, ZEISS developed the FORUM® Glaucoma Workplace.

This new workplace application allows doctors to experience dynamic HFA review. They can change baselines for Guided Progression Analysis™ (GPA™), view Single Field Analysis reports, and generate HFA reports in their practice using a Mac or PC.

ZEISS FORUM Glaucoma Workplace analysis reports offer qualitative and quantitative information in an easy-to-read format. This interpretation guide explains various areas of each report and the valuable information they provide for a doctor's clinical assessment. The guide is intended to provide basic information only; it is not intended to replace the User Manual.

# GPA Summary Report for HFA

The diagnosis and management of glaucoma relies on the assessment of visual field test status and progression as well as other clinical indicators. The GPA Summary Report can help estimate the current stage of visual loss and rate of progression, to support the assessment of a patient's risk of future vision loss.

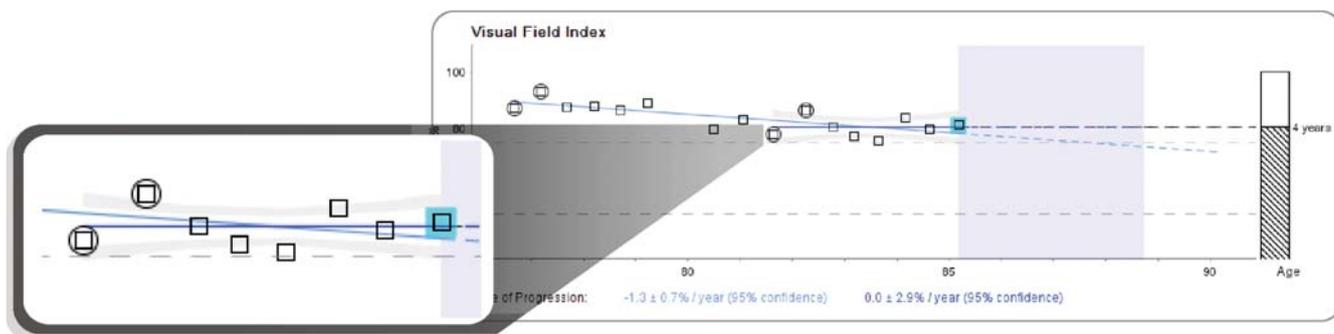


- 1 **VFI Rate of Progression Analysis**  
Trend analysis of the patient's overall visual field history.
- 2 **VFI Plot**  
Regression analysis of VFI values and 2- to 5-year projection.
- 3 **VFI Bar**  
A graphical estimate of the patient's remaining useful vision at the current VFI value along with a 2- to 5-year projection of the VFI regression line if the current trend continues.

- 4 **Baseline Exams**  
Documents initial visual field status.
- 5 **Glaucoma Hemifield Test (GHT)**  
Provides a plain language classification of 30-2 and 24-2 test results based upon patterns of loss commonly seen in glaucoma.
- 6 **Reliability Indices**  
Presented to assist in the evaluation of test reliability – Fixation Loss (FL), False Positive (FP), and False Negative (FN).
- 7 **Global Indices**  
Three summary indices of visual field status – Visual Field Index (VFI), Mean Deviation (MD), and Pattern Standard Deviation (PSD).

- 8 **Gaze Tracking**  
To open the gaze tracking graph, click this symbol 
- 9 **Selected Follow-up Visual Field Summary**  
Report of selected follow-up visual field including VFI, MD, PSD, the Progression Analysis Probability Plot and the GPA alert.
- 10 **GPA Alert**  
A message that indicates whether statistically significant deterioration was noted in consecutive tests.

# Understanding the GPA Summary Electronic Report



## Dual Baseline

Create a dual baseline showing a patient's original baseline and progression.

GPA uses the Visual Field Index™ (VFI™), a summary measurement of a patient's visual field status expressed as a percent of a normal age-adjusted visual field.

Pioneered by Boel Bengtsson, PhD<sup>1</sup> as a more intuitive assessment of visual function, VFI is designed to reflect the vision associated quality of life. VFI is center-weighted to better correspond with the distribution pattern of ganglion cells across the retina. It is less affected by cataract and other media changes compared with earlier indices. VFI is used to quantify the rate of progression on the GPA summary screen, and provides an overview of the patient's available visual field history. The VFI is plotted relative to patient age to calculate the rate of functional change over time.

## GPA Baseline Exams

Two baseline exams appear at the top of the GPA summary tab. Graytone and Pattern Deviation Plots are shown for both GPA Baselines, as well as key indices such as VFI, MD and PSD. The software is programmed to automatically choose the oldest two matching exams as the Baseline. However, it is suggested that the user periodically review the computerized selections to verify that they reliably represent the patient's baseline status.

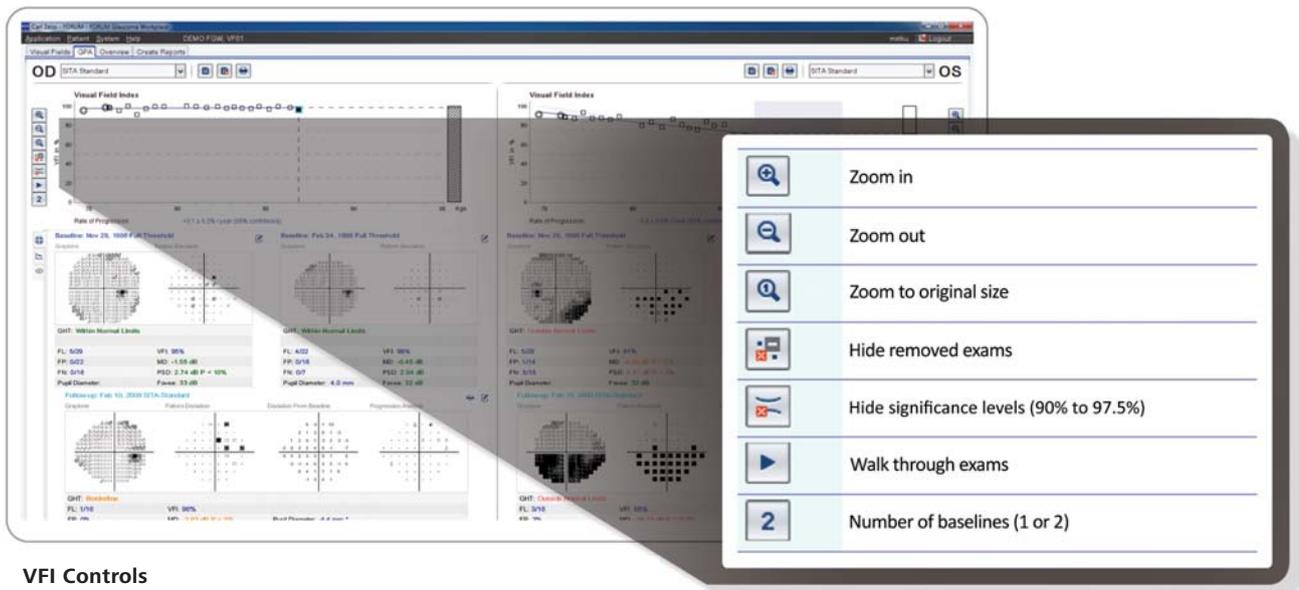
Another feature, GPA with Dual Baselines, allows the user to compare rates of progression, for example, before and after a significant change in therapy. The initial selection of a SITA™ Standard or SITA Fast™ Exam determines the exams that will be included in follow-up evaluations. SITA Standard and SITA Fast Exams cannot be mixed in the GPA analysis. If a series of Baseline and Follow-up examinations include both 24-2 and 30-2 tests, GPA will analyze all tests as if they are 24-2 tests. GPA is not designed to analyze 10-2 tests.

## VFI Plot

In the center of the report, the VFI Plot graphs the VFI values of all exams included in the GPA analysis as a function of the patient's age. When appropriate, the VFI Plot also provides a linear regression analysis of the VFI over time. A minimum of five exams over at least two years must be included in GPA for the linear regression results to be presented.

*Note: In glaucoma, the regression line slope may occasionally be positive due to statistical deviation or Learning Effect. In other cases, for instance, neuro-ophthalmic disease, the regression line slope may be positive due to resolution of the disease.*

<sup>1</sup> Bengtsson B, Heijl A. A visual field index for calculation of glaucoma rate of progression. *Am J Ophthalmol*, Feb 2008; 145(2):343-53.



### VFI Controls

ZEISS FORUM Glaucoma Workplace enables you to modify the VFI plot display according to your preferences.

### VFI Bar

To the right of the VFI Plot is the VFI Bar. The VFI Bar indicates the patient's current VFI value. In addition, when the results of the regression analysis are displayed, the VFI Bar will also graphically indicate a two- to five-year projection of the linear regression line into the future, shown as a broken line. The length of projection is equal to the number of years of HFA data that is available, up to a maximum projection time of five years.

### Deviation from Baseline Plot

The deviation from Baseline Plot compares the pattern deviation of the most recent Follow-up test to the average of the pattern deviation values of the two Baseline tests, and indicates changes at each tested point, in dB notation.

### Progression Analysis

#### Probability Plot

The Progression Analysis Probability Plot gives the statistical significance of the dB changes shown in the deviation from Baseline Plot. It compares the changes between the Baseline and Follow-up exams to the inter-test variability typical of stable glaucoma patients<sup>2</sup> and then shows a plot of point locations, which have changed significantly.

Points that have changed by more than the expected variability are identified with a simple and intuitive set of symbols:

- A **single, solid dot** indicates a point not changing by a statistically significant amount.
- △ A **small open triangle** identifies statistically significant change, i.e., a degree of deterioration expected less than 5% of the time at that location in stable glaucoma patients ( $p < 5\%$ ).
- ▲ A **half-filled triangle** indicates statistically significant deterioration at that point in two consecutive tests.
- ▲ A **solid triangle** indicates significant deterioration at that point in three consecutive tests.
- X An **X** signifies that the data at that point was out of range for analysis. For data that is out of range, GPA cannot determine whether or not the encountered deviation at that point is statistically significant. This occurs mainly with field defects that were already quite deep at Baseline.

### GPA Alert

The GPA Alert is a message in plain language terms that indicates whether the EMGT progression criteria were met. The EMGT progression criteria were developed for use in the Early Manifest Glaucoma Trial<sup>3</sup>. The GPA Alert assists you in recognizing deterioration in consecutive tests. In cases where three or more points show deterioration in at least two consecutive tests, the progression analysis indicates "Possible Progression." In cases where three or more points show deterioration in at least three consecutive tests, the progression analysis indicates "Likely Progression."

Two Possible GPA Alerts:

1. "Possible Progression"
2. "Likely Progression"

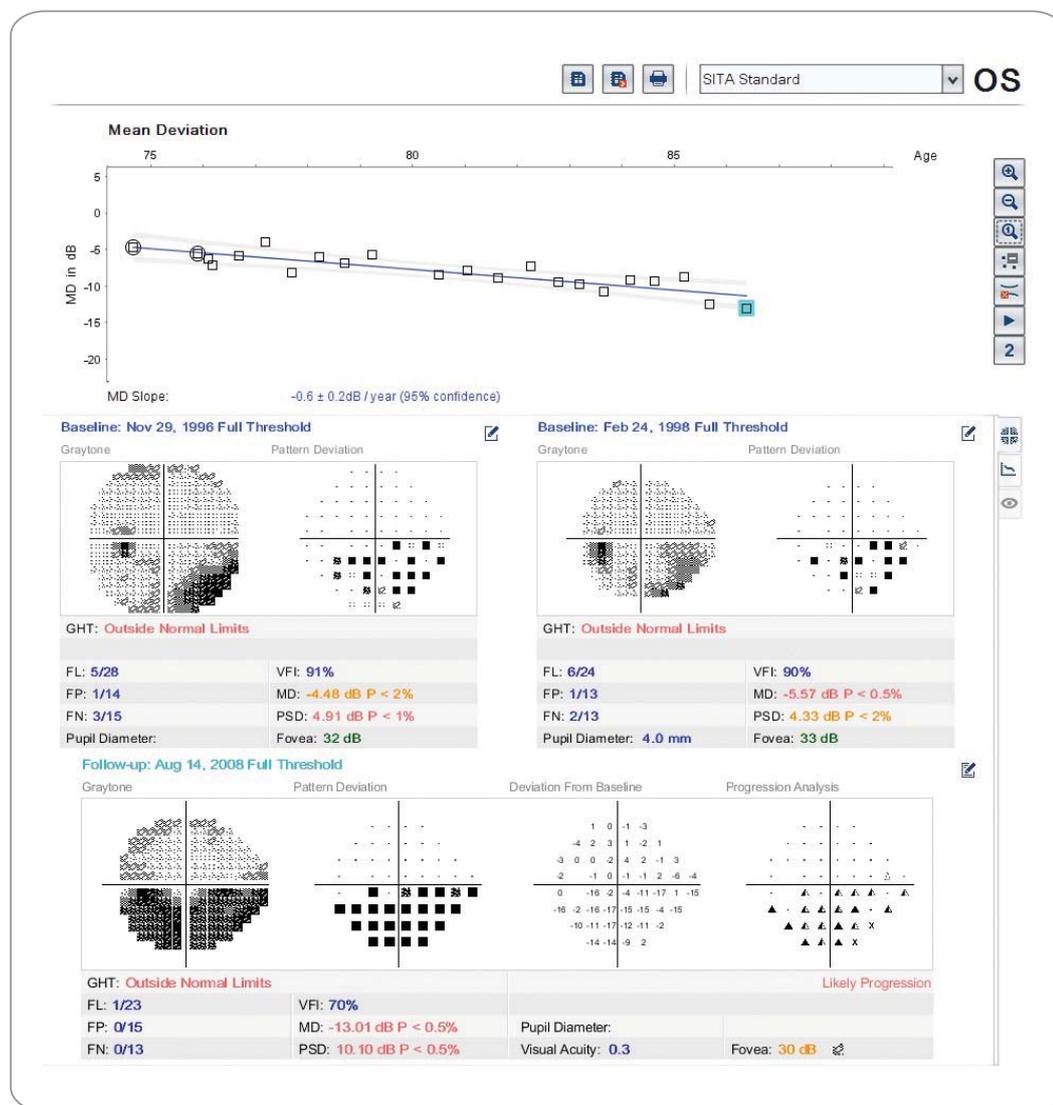
<sup>2</sup> Arnalich-Montiel F, Casas-Llera P, Muñoz-Negrete FJ, Rebolledo G. Performance of glaucoma progression analysis software in a glaucoma population. *Graefes Arch Clin Exp Ophthalmol*, Mar 2009;247(3):391-7. Epub 2008 Nov 4.

<sup>3</sup> Leske MC, Heijl A, Hyman L, Bengtsson B. Early Manifest Glaucoma Trial: design and baseline data. *Ophthalmology*, Nov 1999;106(11):2144-53.

# Progression Analysis using Mean Deviation

## Working with Mean Deviation (MD) instead of the Visual Field Index (VFI) in the trend analysis

ZEISS FORUM Glaucoma Workplace gives the user the option of performing regression analyses using VFI, MD, or both.



### Progression Analysis using Mean Deviation

If five or more fields are analyzed in a progression analysis, and all test results to be analyzed were run with the same strategy, ZEISS FORUM Glaucoma Workplace will automatically perform a linear regression analysis of MD, VFI, or both.

### Baseline Exams

Document initial visual field status.

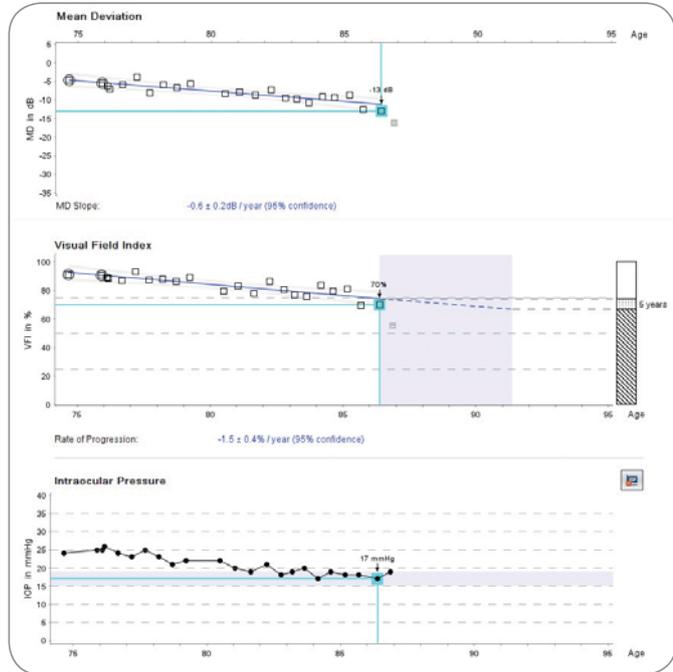
### Selected Follow-up Visual Field

Report of selected follow-up visual field including VFI, MD, PSD, the Progression Analysis Probability Plot and the GPA alert.

# Additional Features

## Intraocular Pressure (IOP)

If IOP values are entered through the HFA or ZEISS FORUM Glaucoma Workplace, the IOP values are displayed in a graphical representation. ZEISS FORUM Glaucoma Workplace will allow the user to compare the graphics for MD, VFI and IOP all in a single report.



## Complete Access to all standard HFA Analyses

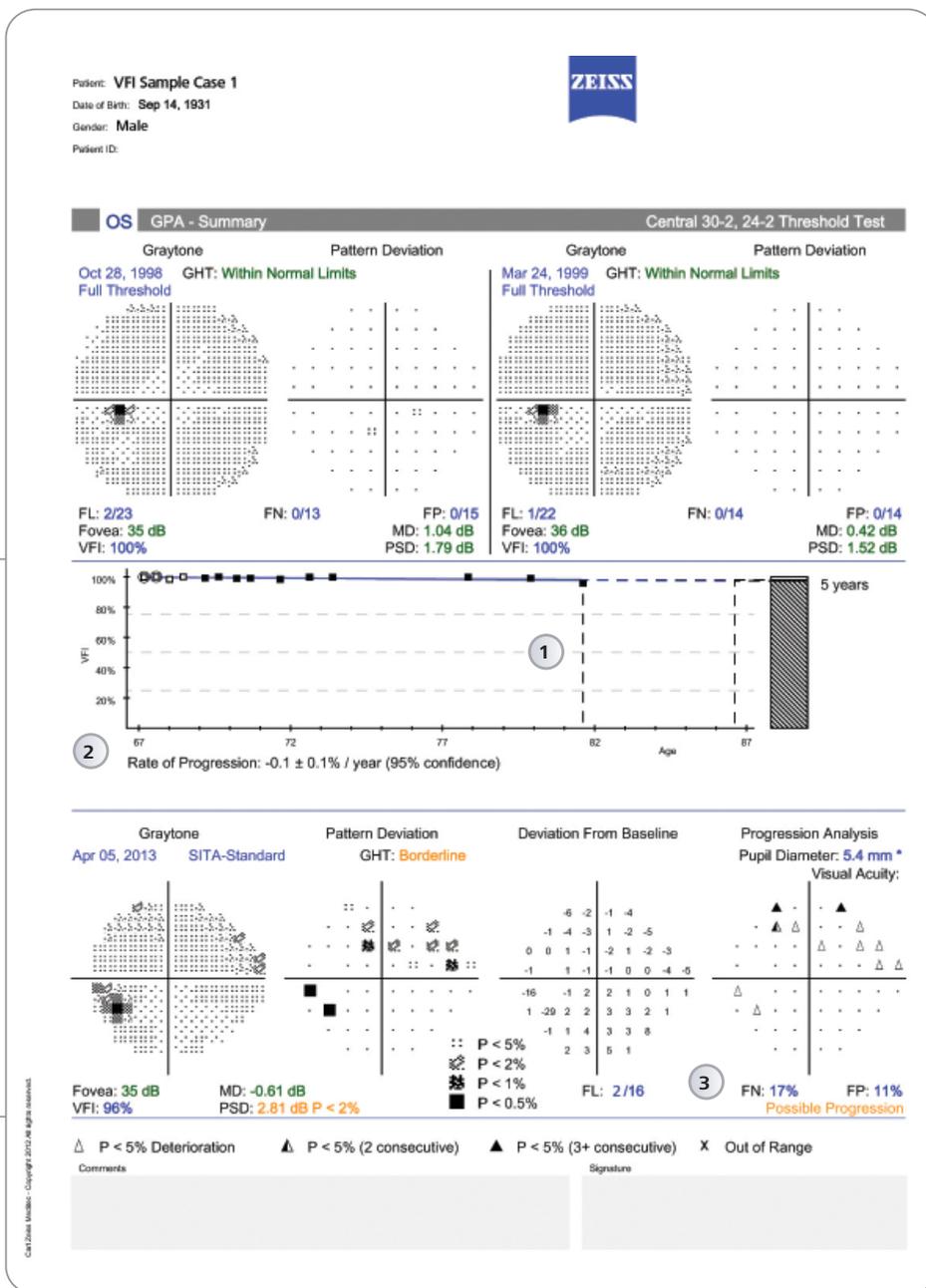
ZEISS FORUM Glaucoma Workplace supports all standard HFA Visual Field Analyses.



# GPA Summary Report – Sample Case 1

## Possible progression

This is an example of a patient with visual field progression that may be statistically significant but may not be clinically significant. While the event analysis, GPA Alert, indicates "Possible Progression" (3), the measured rate of progression in VFI is only 0.1% per year and the confidence interval on that rate estimate is narrow (2). If the present rate of progression continues, this patient would not seem to be at substantial risk of visual disability during his lifetime.

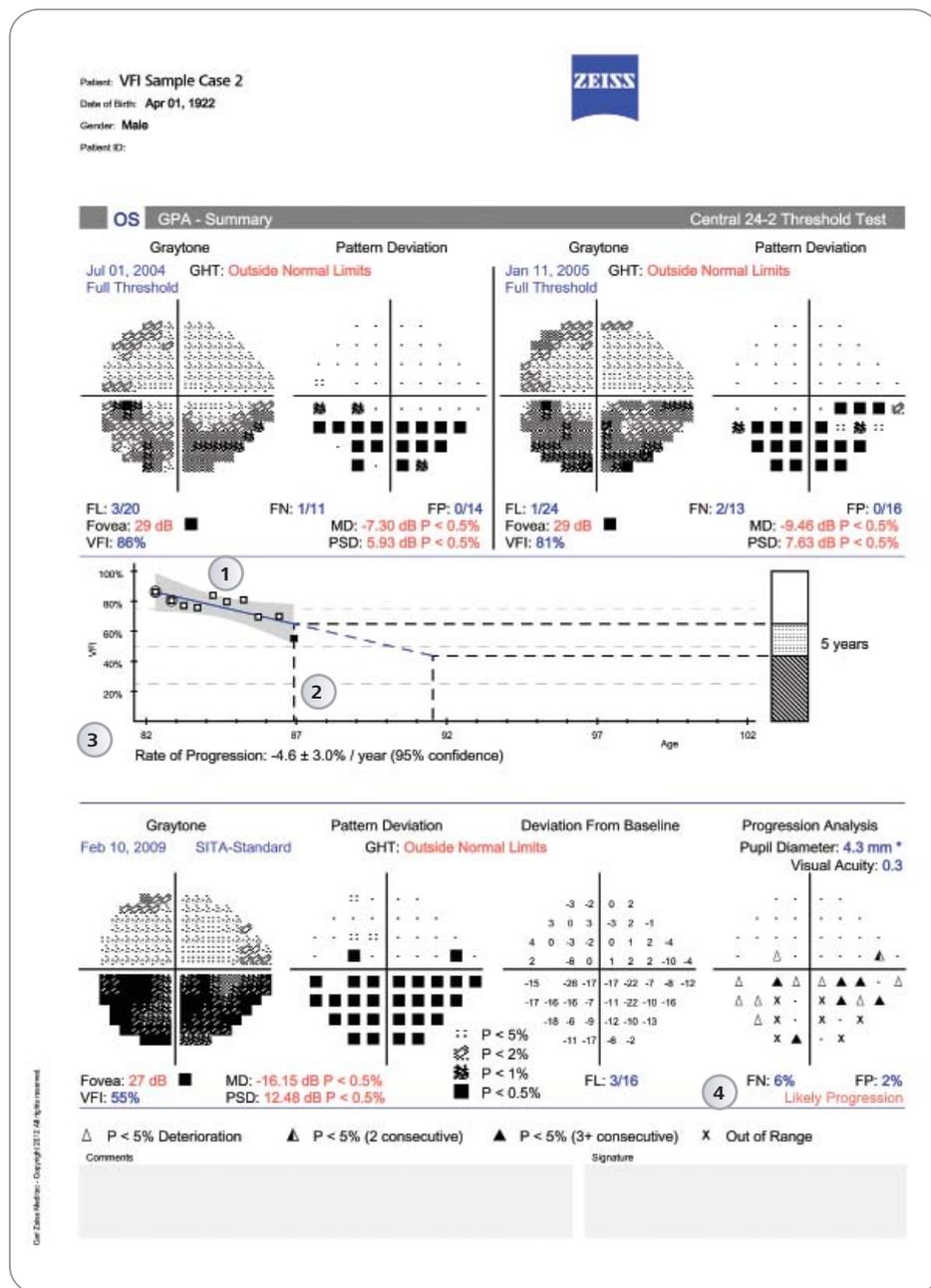


- 1 Patient was 81 years old at the time of the most recent test.
- 2 VFI slope is nearly flat and the confidence intervals are narrow.
- 3 Event analysis (GPA Alert) indicates "Possible Progression".

# GPA Summary Report – Sample Case 2

## Likely progression

This is an example of a patient with statistically significant and possibly clinically significant progression. This patient's visual field loss is measurably progressing based upon the VFI slope and the GPA alert (3 and 4 below). The patient may be at significant risk of further visual loss in the future. These findings can be weighed relative to the possible risks associated with any contemplated escalation in treatment or other factors.



- 1 Gray zone indicates the 95% confidence interval (the area between the 2.5 and 97.5 percentile).
- 2 Patient was 86 years old at the time of the most recent test.
- 3 VFI slope is pronounced, showing a decrease of almost 23% over the past 5 years.
- 4 Event analysis (GPA Alert) indicates "Likely Progression".



**Humphrey Field Analyzer**



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