Interpreting the New v.3.0 GPS Printout

**Patient Information** — Includes ethnic heritage. Data is compared to ethnic-specific normative database.

**Quality** — Clear identification from "excellent" to "very poor." Scores below 30 represent good-quality images.

**Shape Parameter Values** — Reference values for the five parameters that are factored into the probability score. Three parameters represent the optic disc and two represent the RNFL. Sector information is only relevant for two of the five parameters.

**Glucoma Probability Score (GPS)** — Sector classification based on the likelihood of abnormality.
- **Within Normal Limits**
- **Borderline**
- **Outside Normal Limits**

**GPS (Glucoma Probability Score)** — The probability values indicating the likelihood of abnormality for global and sector assessment. Similar sensitivity and specificity to Moorfields Regression Analysis.
- **Within Normal Limits**
- **Borderline**
- **Outside Normal Limits**

**Final Classification** — Overall classification based on all results. Any abnormality detected, either a local sector abnormality or a global abnormality, will trigger a final classification as **outside normal limits**.
A New Paradigm in Disease Detection

The Glaucoma Probability Score, or GPS, is a new approach to analyzing HRT data using the latest artificial intelligence methods, producing an easy way to understand the probability of disease.

- Sophisticated new analysis based on the 3-D shape of the optic disc and peripapillary retinal nerve fiber layer (RNFL)
- Utilizes large, ethnic-selectable databases
- Employs new form of artificial intelligence: a relevance vector machine
- Derives the probability of damage consistent with glaucoma
- Immediate results without drawing a contour line or relying on a reference plane, reducing dependency on operator skill

Artificial Intelligence Using a Relevance Vector Machine

The GPS uses the latest version of artificial intelligence, known as a relevance vector machine or RVM. This is a machine learning system, or computer program, which is “taught” to identify patterns of structural change consistent with glaucoma. The unique advantage of the RVM is that it provides a probability of disease as the output, simplifying interpretation.

Comparison to Moorfields Regression Analysis

The GPS has similar sensitivity and specificity to the Moorfields Regression Analysis. Since the GPS looks at different structural characteristics, the results are not always the same. The Moorfields analysis assesses the health of the rim relative to optic disc size, while the GPS makes a more global assessment by utilizing information from the entire image.

3-D Model Construction

The 3-D model combines the optic disc topographic information with the paripapillary RNFL information.

Shape Analysis

The new software analyzes the shape of the patient’s anatomical structure using a 3-D model of the peripapillary RNFL and the optic disc. The program then calculates a probability of disease (Glaucoma Probability Score) based on how closely the patient’s model compares to healthy and glaucomatous shapes.

The model reflects structural change as the retinal ganglion cells and their axons are lost:

- The RNFL surface becomes flatter
- The cup becomes larger, deeper and the rim slope steeper