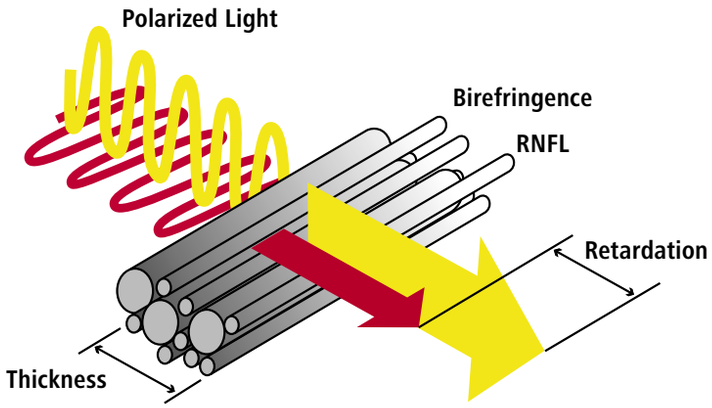
The GDxVCC™

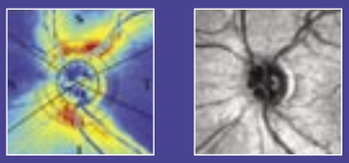
Early answers and ongoing assessment for glaucoma



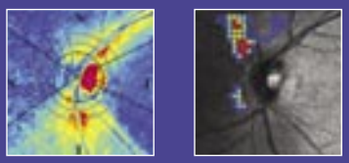
Take the measure of a unique technology

The GDxVCC measures the phase shift (retardation) of polarized light passing through the eye. Retardation is affected by the arrangement and density of RNFL microtubules or other directional elements and tissue thickness.

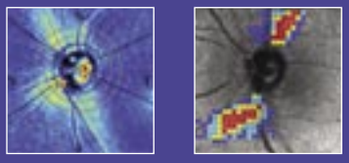
The new Variable Corneal Compensation (VCC) feature determines and corrects for each patient's individual non-RNFL retardation. RNFL retardation has been shown to closely correlate with the location and severity of RNFL structural defects in glaucoma patients.[1]



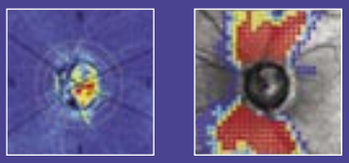
1. Normal
A healthy human retina. Parallel alignment of microtubules within the RNFL typically produces a "bow-tie" pattern of polarization shifts, with "hot" colors transitioning to "warm" hues farther from the optic nerve head.



2. Early RNFL changes
RNFL changes can be detected before visual field defects are evident. The GDxVCC map exhibits incremental shifts toward warm and cool colors. Wedge defects, indicated by the cool colors following the nerve fiber bundles, extend centrally toward the optic nerve head.



3. Moderate RNFL changes
Cool colors dominate the GDxVCC map. Corresponding superior/inferior imbalances in the map usually reflect repeatable visual field defects.



4. Advanced RNFL changes
The GDxVCC map is almost exclusively cool blue, generally corresponding to visual field loss of a similar magnitude in both the superior and inferior hemispheres.

The quantifiable approach to quality care

The GDxVCC offers seamless workflow integration:

- Efficient, easy-to-use system
- Provides highly reproducible answers
- Requires minimal operator training
- Eliminates the need for dilation
- Delivers results quickly
- Provides easy-to-interpret printouts
- Ensures convenience through portability

Early insight for objective answers

Achieving the highest standard of care in glaucoma diagnosis and management means assessing the eye from both a structural and functional point of view.

It also means detecting structural changes at the earliest possible stage—in the retinal nerve fiber layer (RNFL), where early signs of glaucomatous structural damage appear.

While early RNFL changes are frequently difficult to detect during ophthalmoscopic evaluation, they can be clearly quantified with the GDxVCC—a highly specialized, proven system that provides reproducible measurements of RNFL structural parameters closely correlated with the earliest changes of glaucoma.[1]

Simplifying the task of glaucoma assessment

The efficient, easy-to-use GDxVCC compares each patient's RNFL measurements to an age-stratified, multi-ethnic normative database. Using a unique Nerve Fiber Index (NFI) generated by neural network techniques, the GDxVCC combines the most pertinent and significant structural parameters to objectively and reliably determine the likelihood of glaucomatous damage. These specific, sensitive and quantitative measurements greatly simplify the challenging task of assessing glaucomatous structural damage, supporting a higher degree of diagnostic efficiency and a higher standard of care.

Ongoing analysis, continued confidence

The excellent reproducibility of the GDxVCC enables clinicians to evaluate glaucomatous changes over time and adjust the patient's management plan as needed.[2] The GDxVCC further simplifies the process by providing a comprehensive series of visit results with high-resolution images, difference maps and trend lines for crucial disease progression parameters.

GDxVCC

Nerve Fiber Analysis with Variable Corneal Compensation

Objective, quantifiable measurements for early glaucoma detection

TSNIT Parameters

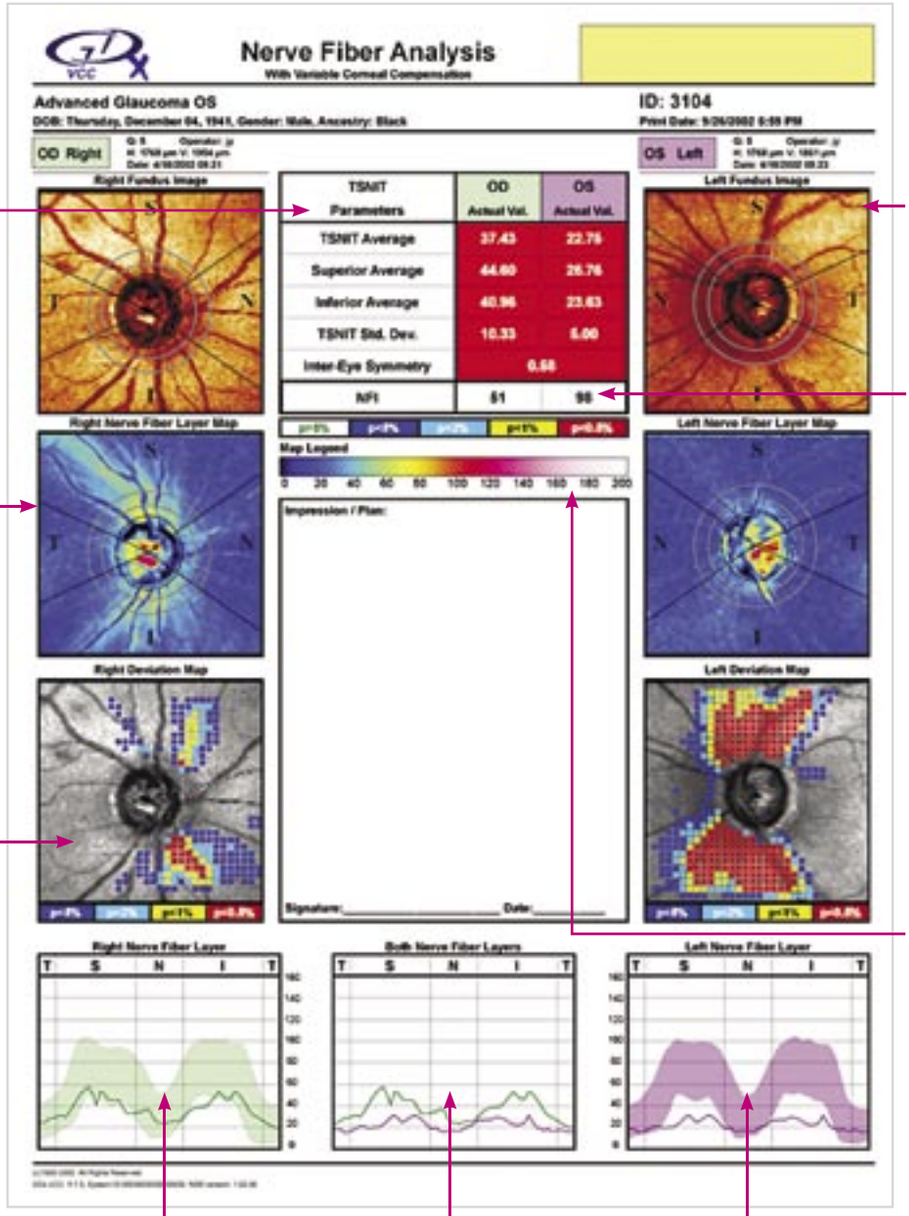
Measurements are obtained from the calculation circle (double line in fundus image). Green letters on white background indicate findings within the normal range. Values falling outside the normal range are indicated by dark blue (P<5%), light-blue (P<2%), yellow (P<1%) and red (P<0.5%).

RNFL Map

RNFL measurements are presented as a color map. Warm colors, yellow to red, indicate findings corresponding to greater RNFL values, while cool colors, green to dark blue, indicate lower levels. An hourglass shape of warm colors around the optic nerve is typical of normal eyes.

Deviation Map

Plot of RNFL values that deviate from the normal range, color-coded by p-value to indicate extent of deviation. Values are overlaid onto the fundus image.



Fundus Image

Overall image should be in good focus, ONH should be well centered, and image illumination even.

NFI

The Nerve Fiber Indicator value is generated by neural network technology, trained with data from normal and glaucomatous eyes. Increasing values indicate increasing likelihood of glaucoma for the examined eye: 0-30, low; 31-50, suspect; 51-100, high.

Color Scale

The color scale indicates RNFL measurements at any given point on the RNFL map.

Temporal-Superior-Nasal-Inferior-Temporal (TSNIT) Graph

Individual eye RNFL values (dark lines) are presented as an overlay on the expected age-related normal range for OD and OS, and as overlays on each other for symmetry analysis in the center graph. TSNIT values are taken from the calculation circle (double line in the fundus image), starting from the temporal quadrant and moving around the calculation circle to the superior, then nasal, then inferior quadrants and then back to the temporal quadrant.

GDxVCC Advanced Serial Analysis for Confident Glaucoma Management

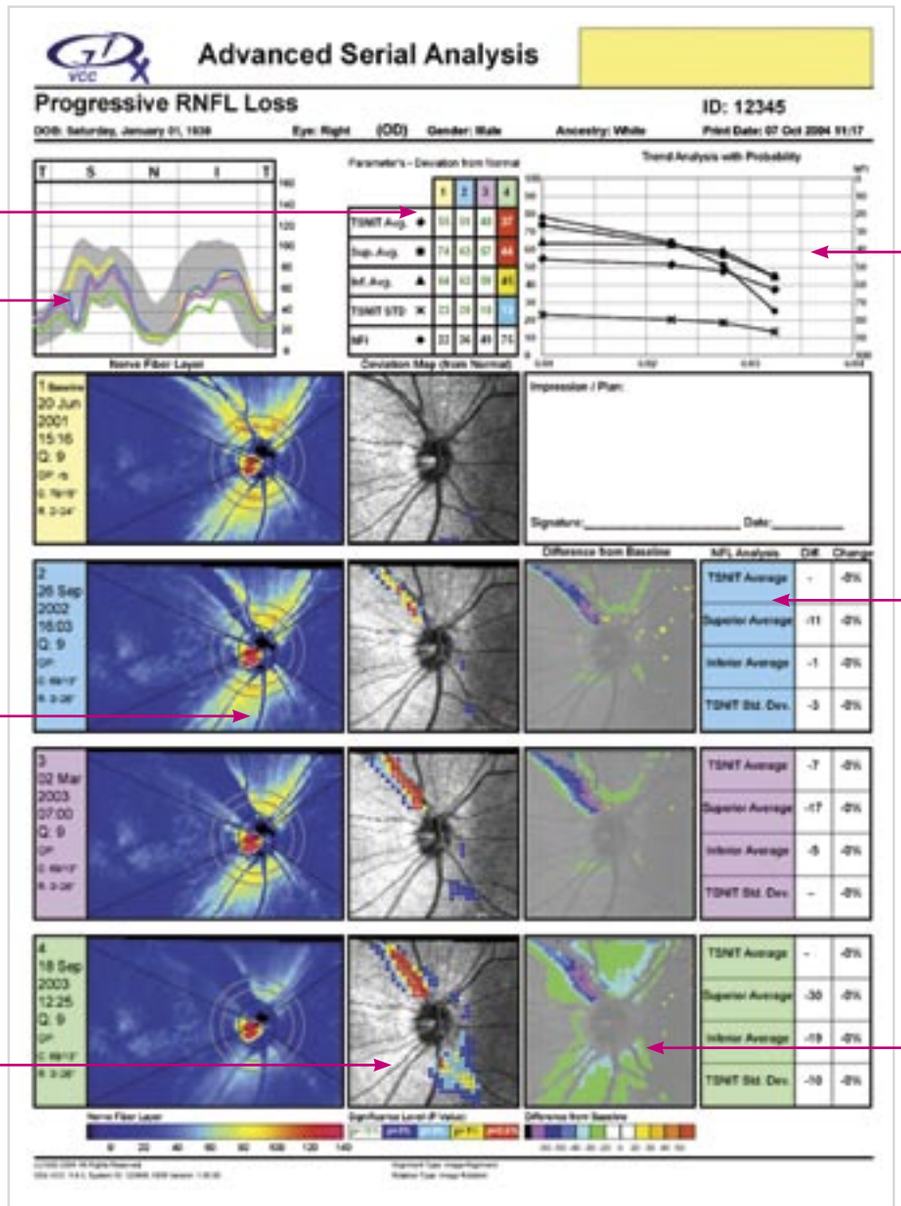
Efficient and simplified presentation of glaucomatous changes over time

Parameter Table
Shows the parameter values at each exam. Values in the normal range are displayed in green; values outside normal limits are color-coded on the basis of their significance.

TSNIT Graphs
Peripapillary RNFL measurements for baseline image (yellow) and follow-up images (blue, pink and green).

Nerve Fiber Layer Map
Shows the RNFL measurements obtained at baseline and follow-up visits. Warmer colors represent measurements corresponding to relatively undamaged RNFL.

Deviation Map
Reveals the location and severity of RNFL defects. Values falling outside normal limits are color-coded to significance limits ranging from P<5% to P<0.5%.



Trend Analysis
Shows the change of parameter values over time. Symbol shapes indicate the parameter being measured.

Parameter Difference Table
Shows the difference between the baseline image and each follow-up measurement. The first column shows the numerical change in each parameter value (comparing each follow-up exam to the baseline image), while the second column shows percent change.

Difference from Baseline
Map shows the difference between the baseline and follow-up exams. Different colors represent magnitude of change.

Carl Zeiss Meditec offers a full complement of innovative, synergistic technologies for the detection and quantifiable analysis of both structural and functional glaucomatous damage. We are committed to supporting the clinician with advanced, easy-to-use instruments that reliably and reproducibly facilitate early diagnosis and management of glaucoma—instruments like the new GDxVCC. For more information on the GDxVCC or our complete line of products for structural and functional analysis of glaucoma, please contact your Carl Zeiss Meditec representative.

Technical Specifications

Illumination laser source	GaAlAs laser diode, 780–798 nm, 40 mW primary power
Laser classification	Class I laser system
Imaging area	40° x 20°
Ametropia correction	–15 to +7 diopters
Data acquisition time	<1 second
Fixation	Internal target
Normative database	Age-adjusted normals with diverse ancestry
Dimensions	14"H x 10"W x 24"D
Display	Integrated color liquid crystal display
Electrical requirements	100–240 volts, 50/60 Hz
Weight	21 kg (45 lbs)
Ambient temperature	65°F–75°F (18°C–24°C)
Ambient humidity	20%–60%

Note: All technical specifications are subject to change without notice.

1. Bagga H, Greenfield DS. Quantitative assessment of structural damage in eyes with localized visual field abnormalities. *Am J Ophthalmol.* 2004 May;137(5):797-805.
2. Blumenthal EZ, Frenkel S. Inter-device reproducibility of the scanning laser polarimeter with variable cornea compensation. *Eye.* 2004 Jul 30.

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