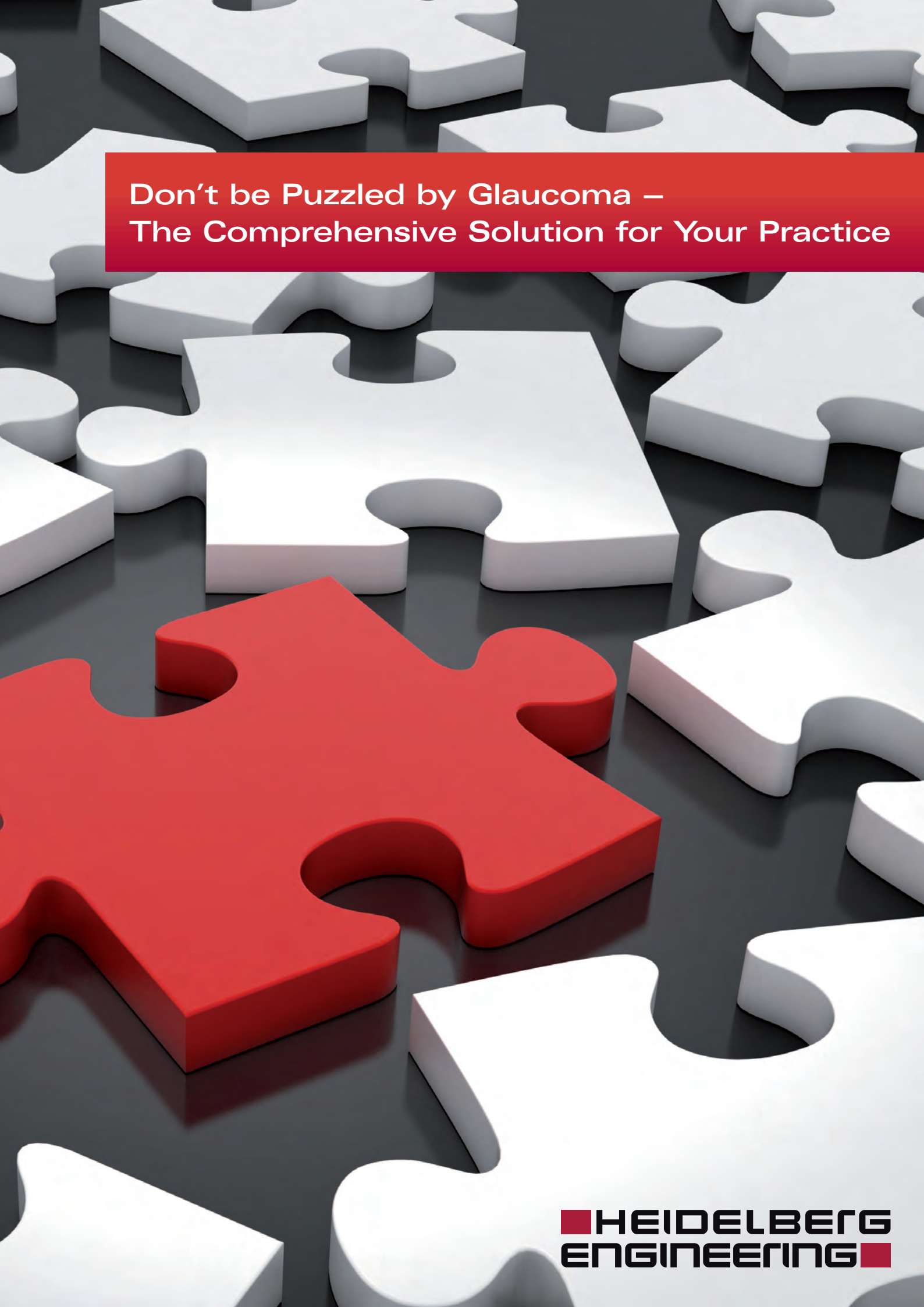


Don’t be Puzzled by Glaucoma – The Comprehensive Solution for Your Practice

HEIDELBERG ENGINEERING

All Pieces of the Puzzle

The Complete Picture of Glaucoma Diagnosis

Glaucoma is one of the leading causes of blindness. Early glaucoma detection and reliable progression analysis may prevent loss of vision. A serious management of glaucoma is the basis of an individualized therapy and excellent patient care.

The detection and monitoring of glaucoma require a targeted combination of clinical observations and reliable examination results. Clinical expertise is always the key to an accurate glaucoma diagnosis.

Structural and functional examinations with Heidelberg Engineering products provide invaluable information to aide in the diagnosis and treatment of glaucoma.

Advanced glaucoma diagnosis demands advanced technology. A complete picture of glaucoma develops only if the diagnostic information fits together like the pieces of a puzzle.

We provide serious diagnostic power for glaucoma!
Comprehensive glaucoma solutions from Heidelberg Engineering.

Flexible Integration – Efficient Networking

Intelligent Use of Patient Data and Optimized Patient Workflow

Efficient integration of diagnostic equipment in the clinical setting can significantly improve workflow and management of an increasing number of patients while delivering a high quality of care.

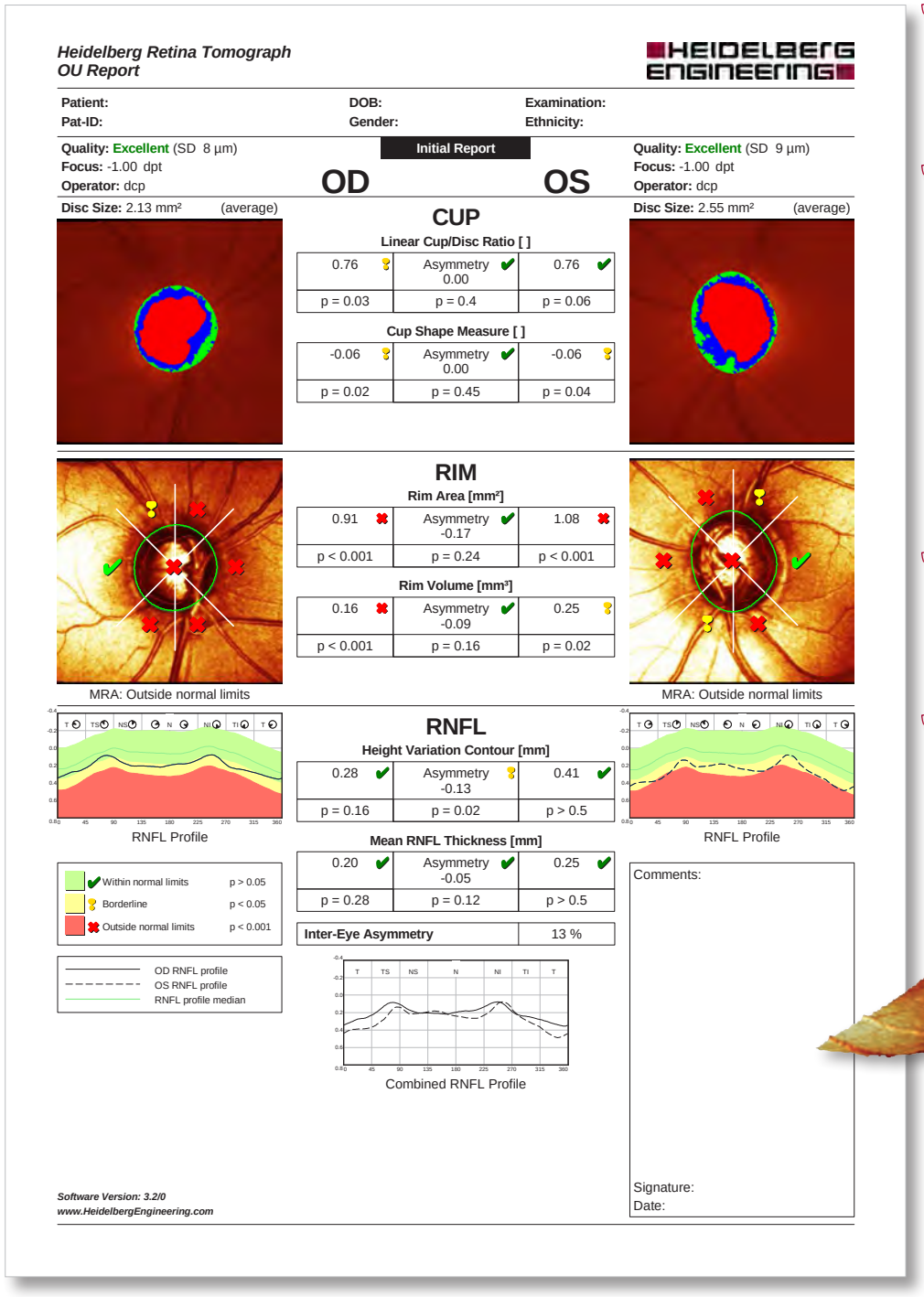
The HEYEX software platform provides flexible solutions from a solo practice to a large clinic environment. The integrated patient database facilitates storage and management of image files from all existing Heidelberg Engineering devices, such as HRT, HEP and SPECTRALIS.

Network viewing software allows easy and reliable access to patient image files on any networked computer supporting seamless consultation and diagnosis.

- One software platform for all Heidelberg Engineering devices
- Network integration and viewing stations
- Data security
- DICOM compatibility
- Connectivity to many electronic health records systems
- Import of third party image data

Validated Diagnostics

The excellent diagnostic performance of the Heidelberg Retina Tomograph (HRT) is well established. The HRT has been used worldwide over 20 years for the detection and management of glaucoma. Advanced algorithms like the Moorfields Regression Analysis (MRA) and the Glaucoma Probability Score (GPS) allow an objective assessment of structural glaucomatous damage. Objective structural parameters complement the 3D topographic profile of the optic nerve head and facilitate a comprehensive risk assessment of suspect glaucoma patients.



Heidelberg Retina Tomograph
OU Report

HEIDELBERG ENGINEERING

Patient: **DOB:** **Examination:**
Pat-ID: **Gender:** **Ethnicity:**

Initial Report

OD		OS
Quality: Excellent (SD 8 µm)		**Quality:** Excellent (SD 9 µm)
Focus: -1.00 dpt		**Focus:** -1.00 dpt
Operator: dcp		**Operator:** dcp
Disc Size: 2.13 mm² (average)		**Disc Size:** 2.55 mm² (average)

CUP

Linear Cup/Disc Ratio [ ]

0.76	Asymmetry 0.00	0.76
p = 0.03	p = 0.4	p = 0.06

Cup Shape Measure [ ]

-0.06	Asymmetry 0.00	-0.06
p = 0.02	p = 0.45	p = 0.04

RIM

Rim Area [mm²]

0.91	Asymmetry -0.17	1.08
p < 0.001	p = 0.24	p < 0.001

Rim Volume [mm³]

0.16	Asymmetry -0.09	0.25
p < 0.001	p = 0.16	p = 0.02

MRA: Outside normal limits

MRA: Outside normal limits

RNFL

Height Variation Contour [mm]

0.28	Asymmetry -0.13	0.41
p = 0.16	p = 0.02	p > 0.5

RNFL Profile

RNFL Profile

Mean RNFL Thickness [mm]

0.20	Asymmetry -0.05	0.25
p = 0.28	p = 0.12	p > 0.5

Inter-Eye Asymmetry	13 %

Within normal limits p > 0.05
Borderline p < 0.05
Outside normal limits p < 0.001

OD RNFL profile
OS RNFL profile
RNFL profile median

Combined RNFL Profile

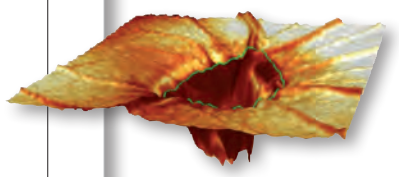
Comments:

Signature:
Date:

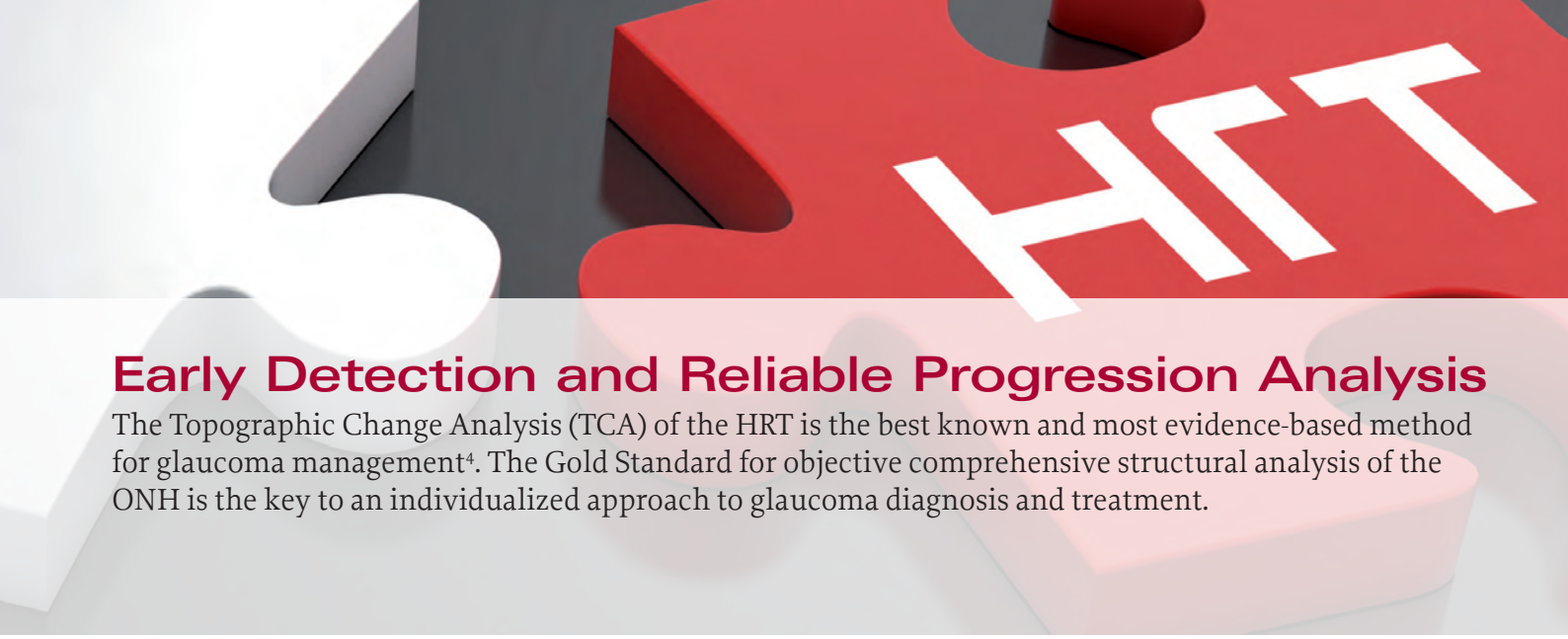
Software Version: 3.2/0
www.HeidelbergEngineering.com

Examination Report – HRT Moorfields Regression Analysis

- All relevant anatomic structures at a glance – optic nerve head (ONH) excavation, neuroretinal rim and peripapillary retinal nerve fiber layer
- Weinreb 2010: Baseline GPS, MRA, and stereoparameters alone or when combined with baseline clinical and demographic factors can be used to predict the development of POAG end points in OHTS (Ocular Hypertensive Treatment Study) participants and are as effective as stereo photographs for estimating the risk of developing POAG in ocular hypertensive subjects[1]
- Zangwill 2005: HRT MRA is the top predictive factor for glaucoma and can identify those patients at high risk for developing the disease[2]
- Strouthidis 2010: In clinical practice, patients with both an abnormal MRA and an abnormal GPS classification at presentation should be followed closely as they have an increased risk of future visual field or HRT change[3]



[1] Weinreb RN et al; Ophthamol 2010; 117:1674–1683.
[2] Zangwill LM. et al.; Arch Ophthalmol 2005;123:1188-1197.
[3] Strouthidis NG et al.; Glaucoma 2010; 19(5):304-309.



Early Detection and Reliable Progression Analysis

The Topographic Change Analysis (TCA) of the HRT is the best known and most evidence-based method for glaucoma management[4]. The Gold Standard for objective comprehensive structural analysis of the ONH is the key to an individualized approach to glaucoma diagnosis and treatment.

Heidelberg Retina Tomograph
TCA Overview

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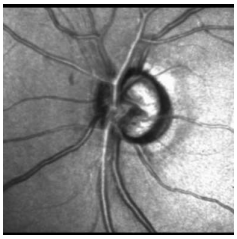
Patient:

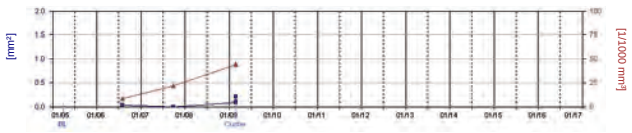
Sex: DOB: Pat-ID: Ethnicity:

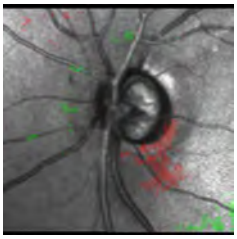
Examination: Baseline: Last Follow-Up: Elapsed:

OS

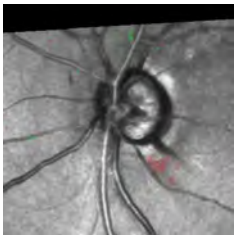


Baseline: 30.Mrz.2005

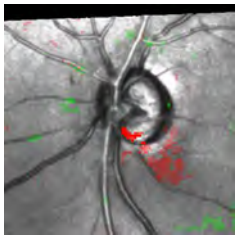




Follow-Up: #2, 01.Aug.2006



Follow-Up: #3, 26.Sep.2007



Follow-Up: #4, 23.Feb.2009

Page 1/1 *Software Version: 3.2.0.5/370*

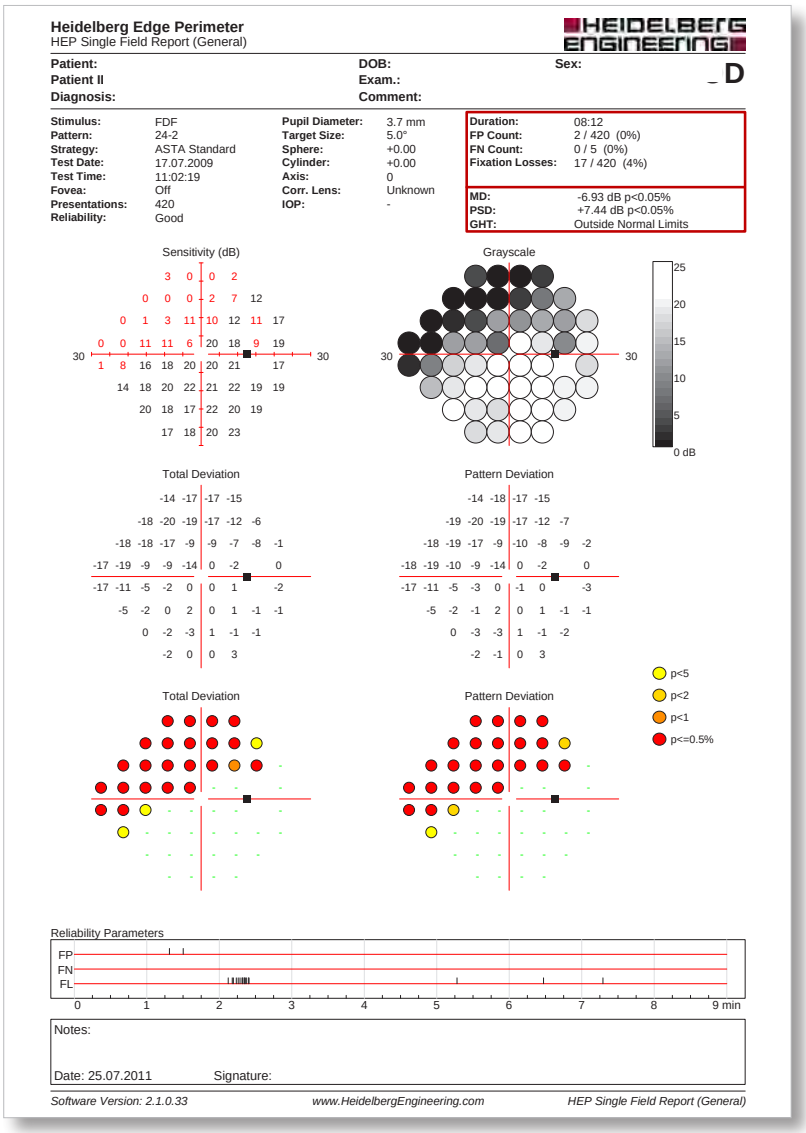
- ONH and retinal nerve fiber layer change at a glance
- Early detection of subtle glaucomatous changes i.e. disease progression
- Trend analysis – Volume and area changes indicated
- Contour-line and reference plane independent
- Follow-up examinations and single scans automatically aligned

[4] Chauhan BC. et al.; Invest Ophthalmol Vis Sci 2000; 41:775-782.

Examination Report – HRT Topographic Change Analysis

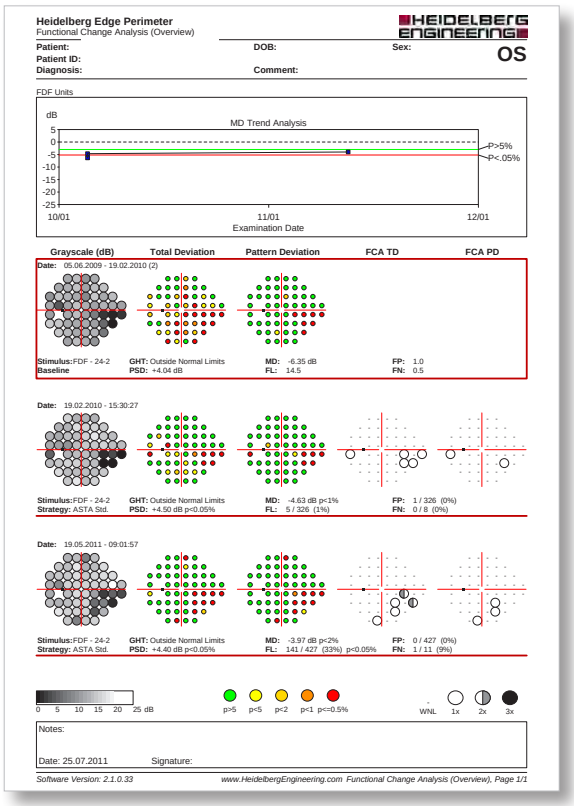
One Perimeter – Two Methods

The visual field examination remains an essential part of glaucoma diagnosis and management, despite rapid developments in imaging technologies[5]. Heidelberg Engineering complements the Gold Standard of structural glaucoma diagnosis, the Heidelberg Retina Tomograph (HRT) with an innovative and reliable partner, the Heidelberg Edge Perimeter (HEP). The HEP offers two perimetric methods in one device.



Examination Report – HEP Single Exam Report

- Flicker-Defined-Form (FDF) Perimetry for early glaucoma detection in patients at risk and ocular hypertensive patients
- The Gold Standard, White-on-White Perimetry (SAP) for continuous care of patients with manifest glaucoma
- Unique Legacy Scale for a direct comparison with HFA examination results
- The Functional Change Analysis FCA allows monitoring of significant functional changes over time



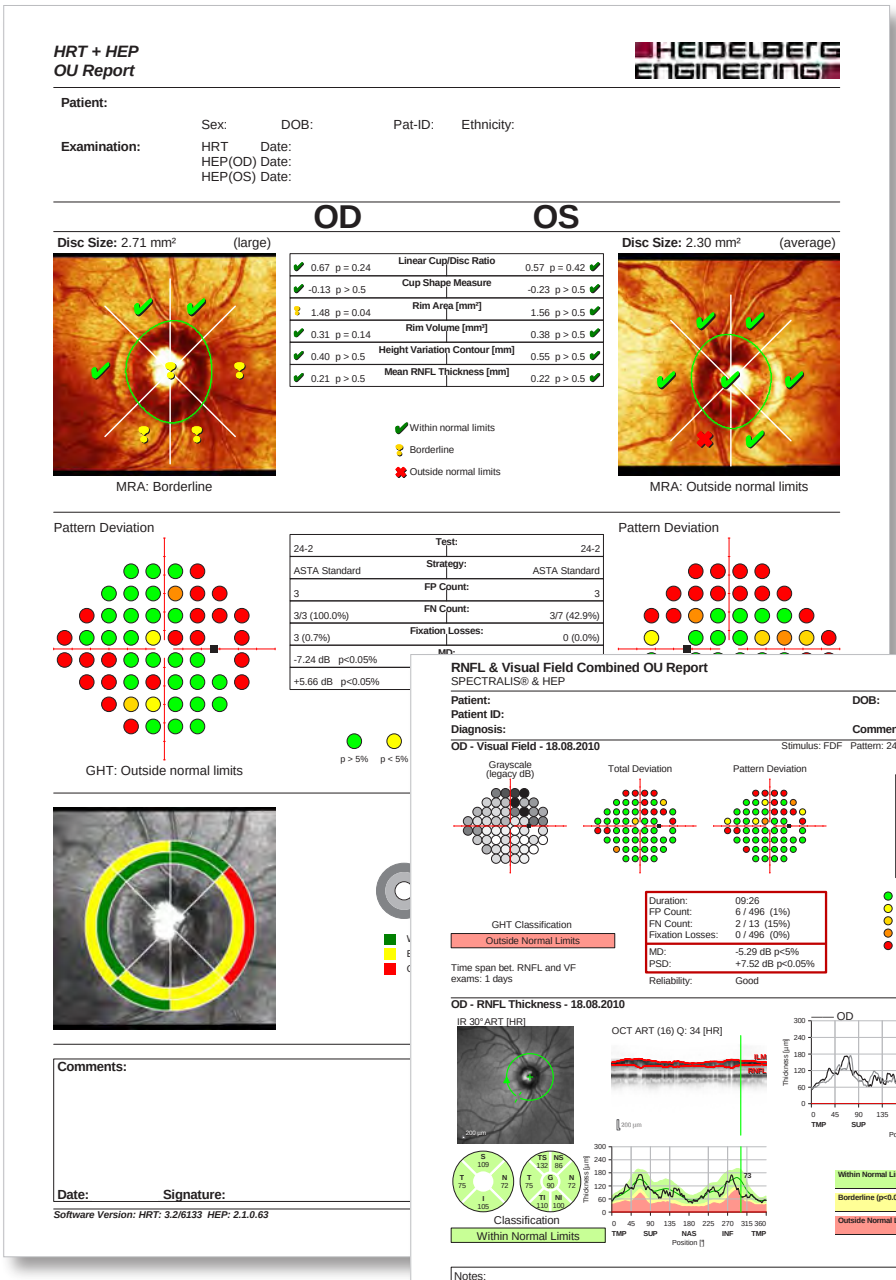
Examination Report – Functional Change Analysis FCA

[5] Terminology and Guidelines for Glaucoma. 3rd Edition (2008). European Glaucoma Society. Image courtesy Dr. Fritz Dannheim, Seevetal-Hittfeld, Germany

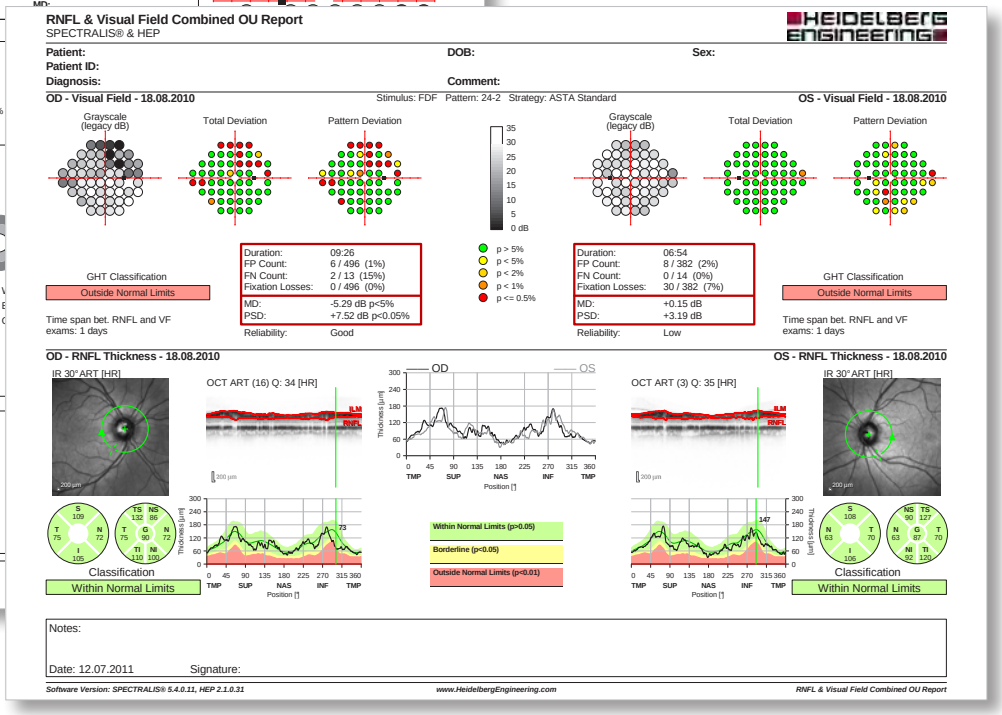
Structure and Function

Clinically, glaucomatous damage is typically diagnosed by combining structural and functional assessments. In particular, anatomical structural damage detected by Confocal Scanning Laser Ophthalmoscopy (HRT) or Optical Coherence Tomography (OCT) is compared to changes in the visual field (VF) sensitivity as measured by FDF Perimetry or SAP. Heidelberg Engineering combines datasets of HRT, SPECTRALIS and HEP in the common software platform HEYEX, and conjointly displays structure-function results on a single report.

- All relevant information on one printout
- First real correlation of structural and functional examination results
- Reliable clinical diagnosis
- Improved patient and time management



HRT & HEP –
Unique Structure-Function Map



SPECTRALIS & HEP –
Combined RNFL & VF Report

Image Courtesy Dr. Fritz Dannheim, Seevetal-Hittfeld, Germany and
Dr. Victor Spears, Toronto, Canada.

Precision

The SPECTRALIS enables the precise measurement of the peri-papillary retinal nerve fiber layer thickness. Comparing the measurement to a normative database allows a fast and reliable detection of local nerve fiber defects. The examination results are comprehensively documented and summarized.

RNFL Single Exam Report OU with FoDi™
SPECTRALIS® Tracking Laser Tomography

HEIDELBERG ENGINEERING

Patient: DOB: Sex:
Patient ID: Exam.:
Diagnosis: Comment:

OD — IR 30° ART [HS] — OCT ART (10) O: 31 [HS]
Asymmetry OD - OS
OS — IR 30° ART [HS] — OCT ART (16) O: 26 [HS]

Within Normal Limits (p>0.05)
Borderline (p<0.05)
Outside Normal Limits (p<0.01)

Thickness [µm] — Position [°] — TMP SUP NAS INF TMP

OD OS

Classification OD: Outside Normal Limits
Classification OS: Outside Normal Limits

Notes:
Date: Signature:

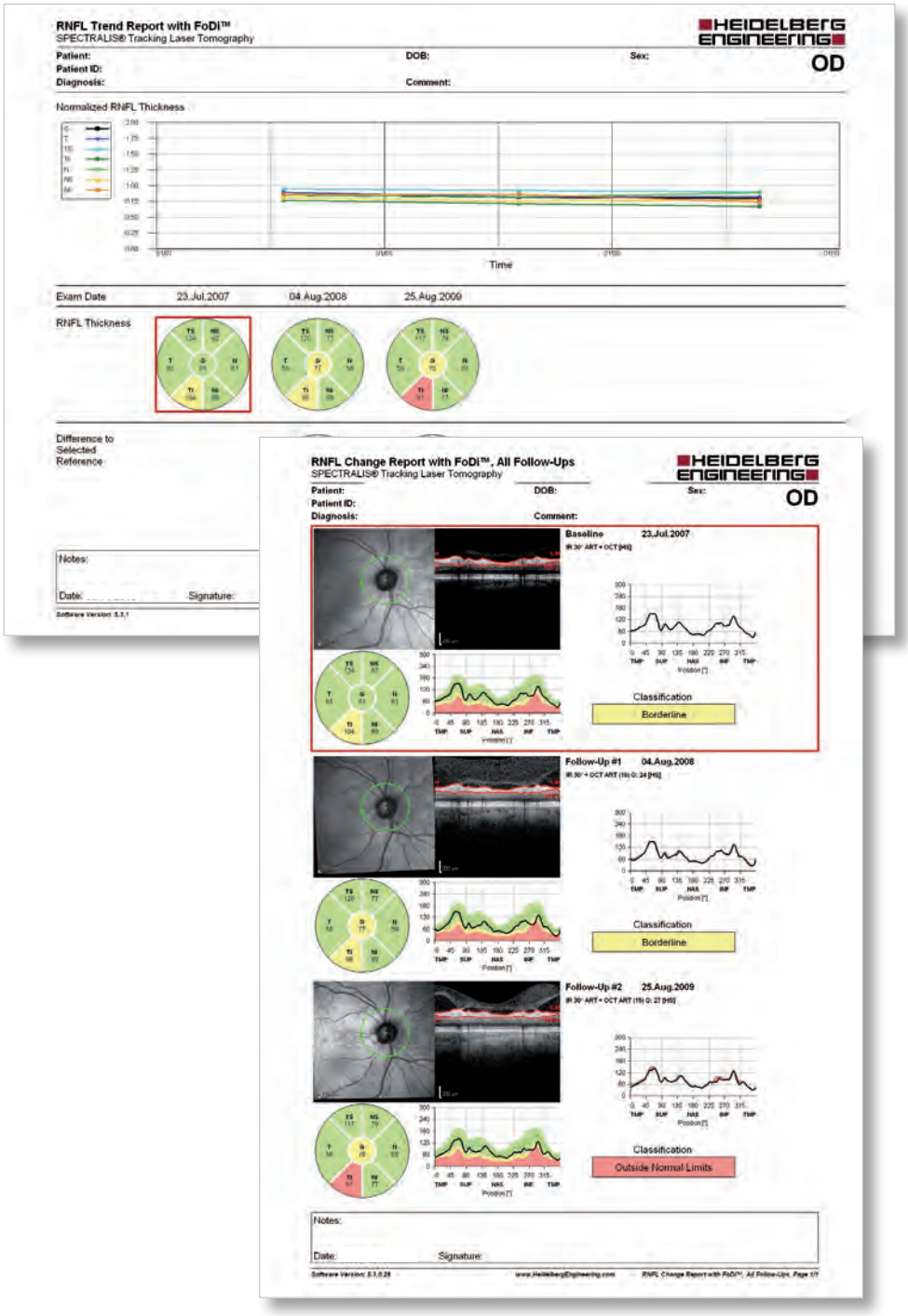
Software Version: 5.3.0.29 www.HeidelbergEngineering.com RNFL Single Exam Report OU with FoDi™

Examination Report – RNFL Single Exam Report OU

- Precise measurement of retinal nerve fiber layer thickness
- Evaluation of more than 1,500 data points on a single circle scan around the optic nerve head
- Automatic comparison to an age-adjusted normative database to classify a patient as being within or outside normal limits
- High sensitivity and specificity with TruTrack™ Active Eye Tracking and Fovea-to-Disc (FoDi™) alignment
- High-quality fundus images even under challenging conditions (e.g. cataract)

Reproducibility

The reliable detection of change is critical and defines glaucoma in suspect patients. With the SPECTRALIS changes in nerve fiber layer and retinal thickness as small as 1 µm can be identified.[7,8] Structured reports enable a comprehensive documentation of change over time.



Examination Report – RNFL progression

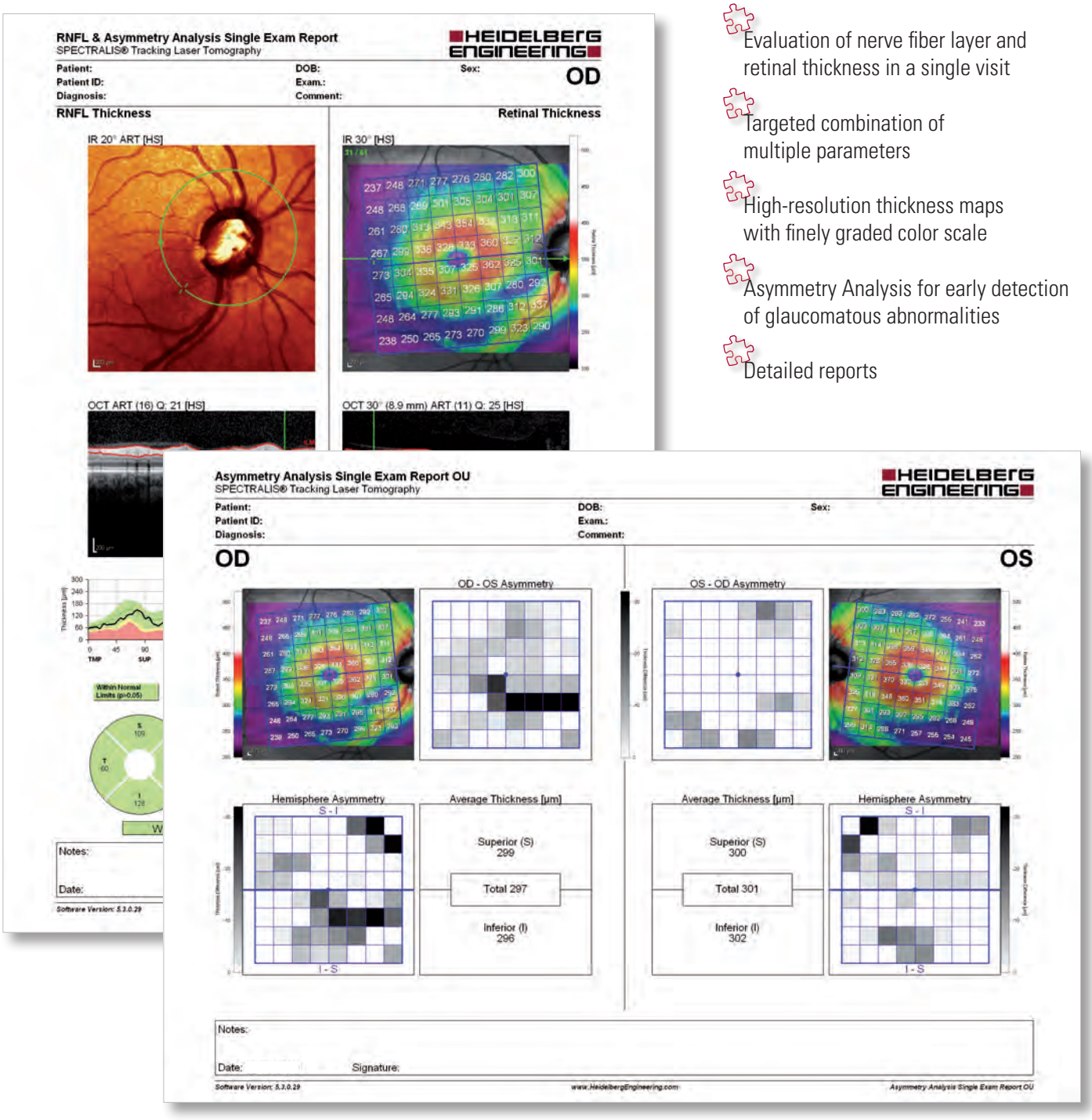
- Reliable identification of changes as small as 1µm
- AutoRescan™ function for follow-up exams
- Color-coding of local changes
- Visualization of disease progression for easy interpretation
- Comprehensive documentation of change over time
- Fast localization of nerve fiber layer changes

[7] Wolf-Schnurrbusch et al. Macular thickness measurements in healthy eyes using six different optical coherence tomography instruments. Invest Ophthalmol Vis Sci. 2009; 50:3432-3437.

[8] Wu et al. Reproducibility of retinal nerve fiber layer thickness measurements using spectral domain optical coherence tomography. J Glaucoma. 2010 (Published online ahead of print).

Innovative Concepts

The Posterior Pole Asymmetry Analysis combines mapping of retinal thickness over the entire posterior pole with an innovative asymmetry analysis. The full geographic extend of nerve fiber and ganglion cell layer defects can be visualized. The combination of nerve fiber layer thickness and retinal thickness provides an even more robust parameter for glaucoma detection and monitoring of change over time.

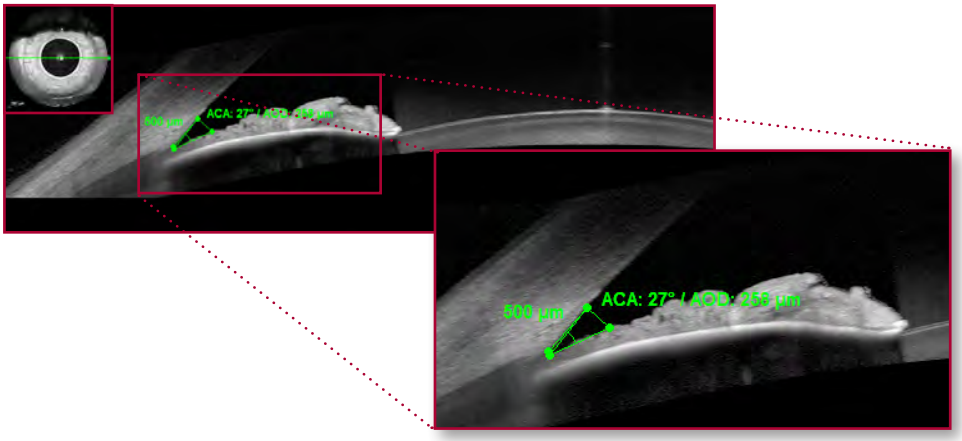


- Evaluation of nerve fiber layer and retinal thickness in a single visit
- Targeted combination of multiple parameters
- High-resolution thickness maps with finely graded color scale
- Asymmetry Analysis for early detection of glaucomatous abnormalities
- Detailed reports

Examination Report – RNFL & Asymmetry Analysis

Excellent Image Quality

Anterior Chamber Angle assessment is typically used in a comprehensive glaucoma diagnosis to exclude Angle Closure Glaucoma. The SPECTRALIS Anterior Segment Module offers image acquisition of the Cornea and the Sclera. Moreover, both anterior chamber angles can be visualized in a single SD-OCT scan for an efficient glaucoma diagnosis.



- 16 mm SD-OCT scan
- High-resolution images acquired with TruTrack™ Active Eye Tracking and Heidelberg Noise Reduction
- Manual measurement tools for Anterior Chamber Angle assessment

Overview Report
SPECTRALIS® Tracking Laser Tomography

HEIDELBERG ENGINEERING

Patient:	**DOB:**	**Sex:**
Patient ID:	**Exam.:**	**OD**
Diagnosis:	**Comment:**	

IR 30° ART + OCT 30° (16.7 mm) ART (60) Q: 45 EDI [HR]

IR 30° ART + OCT 30° (16.7 mm) ART (54) Q: 46 EDI [HR]

Notes:

Date: Signature:

Software Version 5.4 *www.HeidelbergEngineering.com* *Overview Report, Page 1*

Examination Report – Anterior Segment Module

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