

GDx – Glaucoma Diagnosis – Optical Coherence Tomography For Glaucoma / Optic Disc

Previously the optic disc would be examined directly to decide if the disc is cupped/damaged from glaucoma. Stereo disc photographs have been used, but currently there is no true stereo disc camera available in the UK.

Heidelberg Retinal Tomography was used but personally I never found this technology very useful.

GDx Technology that Zeiss has developed and incorporated into the Cirrus Optical Coherence Tomography combines analysis of nerve fibre thickness ie the amount of actual nerves entering the disc as well as structural size of the disc.

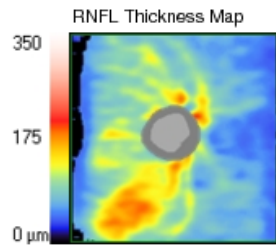
This is nicely presented in a report form below.

In my view this represents the state of the art way of evaluating if a person has glaucoma and monitoring over time. It is well know that 1/3 of pateints may have defects of the nerve fibre yet the computerised Humphrey visual fields are normal – ie the brain is adapting and managing with fewer nerve fibres. With GDx one now talks also about “Pre-parametric glaucoma” ie fields are normal, intra-ocular pressure is raised but GDx is abnormal.

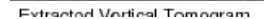
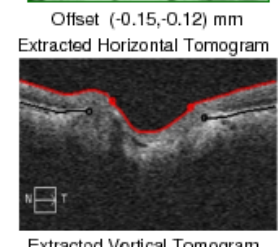
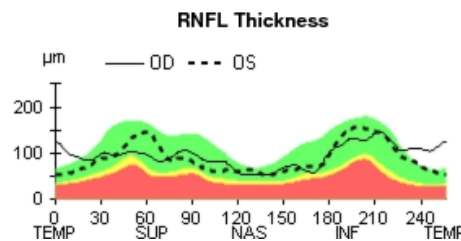
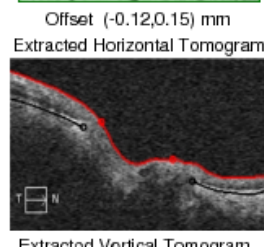
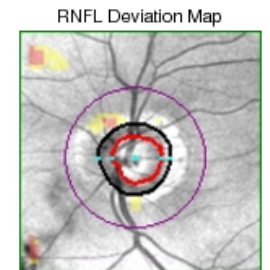
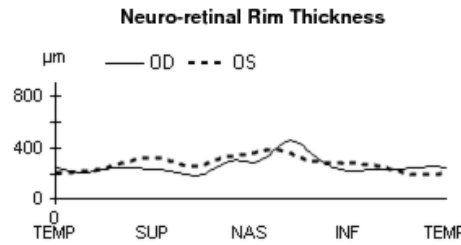
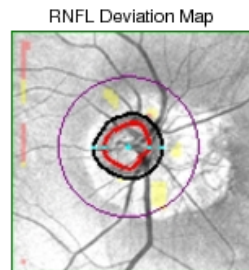
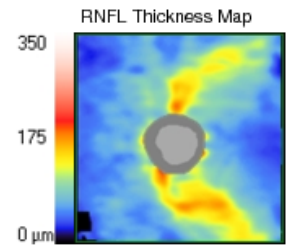
The Key glaucoma tests are:

- 1. intra-ocular pressure measurements**
- 2. Corneal thickness – Pachymetry**
- 3. Iris configuration – eg narrow or open angle**
- 4. computerised Humphrey visual fields**
- 5. Optic disc analysis – GDx.**

Below is GDx (Glaucoma Diagnosis) (is a scanning laser Ophthalmoscope using Optical Coherence Tomography to measure the thickness of the transparent nerve fibre layer

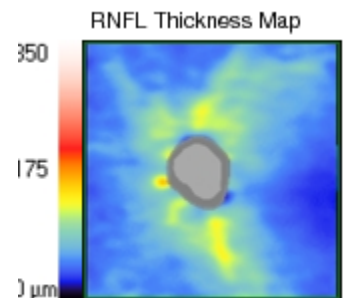


	OD	OS
Average RNFL Thickness	95 μm	90 μm
RNFL Symmetry	64%	
Rim Area	1.18 mm^2	1.31 mm^2
Disc Area	2.22 mm^2	2.43 mm^2
Average C/D Ratio	0.67	0.67
Vertical C/D Ratio	0.69	0.66
Cup Volume	0.238 mm^3	0.305 mm^3



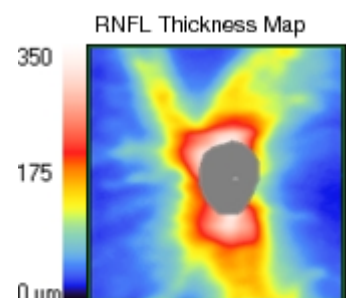
adjacent to the optic nerve head. This gives an objective measurement of the thickness of the optic nerve fibres as they come out of the optic disc. It can detect glaucoma more than 6 years before visual field defects occur (Called pre-parametric chronic open angle glaucoma). In addition it is able to give statistics on the Optic disc size and volume which is also helpful as well as being able to track changes in the Retinal nerve fibre layer over time.

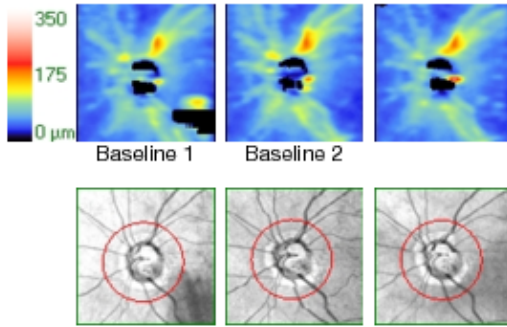
Deeply cupped disc with almost no nerve fibres left. Nerve fibres appear as Red.



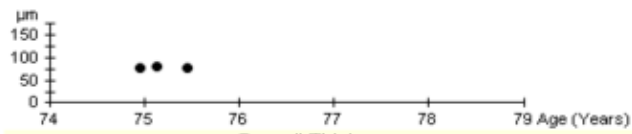
This is an example of nice healthy looking nerve fibres, all the red indicate thick nerve fibre layer.

After 3 scans K9 can look back and compare previous scans and see if there is any change in the optic nerve fibres. This is a great way of seeing if glaucoma has advanced or is stable.

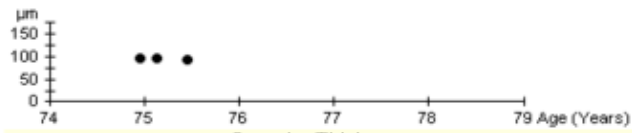




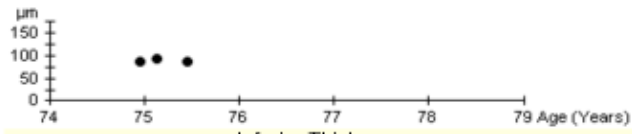
Average RNFL Thickness



Overall Thickness

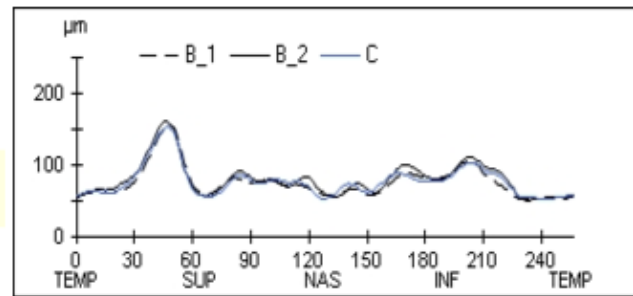


Superior Thickness



Inferior Thickness

RNFL Thickness Profiles



RNFL Summary OS

- RNFL Thickness Map Progression
- RNFL Thickness Profiles Progression
- Average RNFL Thickness Progression

Possible loss

Likely loss

Possible Increase