



Optical Coherence Tomography (OCT)

OCT is an imaging system designed to acquire high resolution cross-sectional retinal images.

Differentiation of retinal layers at a near-histological level is possible owing to a very high depth resolution and because different tissue structures reflect light with different intensities.

The major clinical application of OCT at present is the qualitative and quantitative analysis of retinal pathologies.

OCT analysis of the RNFL thickness is of great potential in the diagnosis and monitoring of glaucoma.

A circular scan centred on the ONH to measure the thickness of the peripapillary RNFL, analysis of the macular and ONH topography has become the standard for glaucoma diagnostics.

OCT provides real-time, immediate and objective quantitative assessments of RNFL, macular and ONH topography.

SAGS supports the following management of SA glaucoma patients:

- 1) adequate pressure reduction to prevent further glaucoma damage
- 2) prevention of further rate of progression using the following tests:
 - a) functional test with HA 24-2 or HA 10-2
 - b) structural test with OCT evaluating ON topography, RNFL and macular thicknessboth tests need to be done initially at diagnosis and yearly for follow up rate of progression. Other structural assessments like disc photography, HRT or GDx are also recommended.

The South African Glaucoma Society strongly recommends OCT to be used for the initial diagnosis, and the yearly follow-up of a glaucoma patient. In difficult to control patients, OCT may be needed twice yearly.

This policy document needs references

1. Kuang TM, Zhang C, Zangwill LM, et al. Estimating lead time gained by optical coherence tomography in detecting glaucoma before development of visual field defects. *Ophthalmology*. 2015;122(10):2002-2009.
2. Schuman JS, Hee MR, Puliafito CA, et al. Quantification of nerve fiber layer thickness in normal and glaucomatous eyes using optical coherence tomography. *Arch Ophthalmol*. 1995;113(5):586-596.
3. Mwanza JC, Warren JL, Budenz DL; Ganglion Cell Analysis Study G. Combining spectral domain optical coherence tomography structural parameters for the diagnosis of glaucoma with early visual field loss. *Invest Ophthalmol Vis Sci*. 2013;54(13):8393-8400.
4. Larrosa JM, Moreno-Montanes J, Martinez-de-la-Casa JM, et al. A diagnostic calculator for detecting glaucoma on the basis of retinal nerve fiber layer, optic disc, and retinal ganglion cell analysis by optical coherence tomography. *Invest Ophthalmol Vis Sci*. 2015;56(11):6788-6795.
5. Mwanza JC, Oakley JD, Budenz DL, Anderson DR; Cirrus Optical Coherence Tomography Normative Database Study G. Ability of Cirrus HD-OCT optic nerve head parameters to discriminate normal from glaucomatous eyes. *Ophthalmology*. 2011;118(2):241-248 e241.
6. Wu H, de Boer JF, Chen TC. Diagnostic capability of spectral-domain optical coherence tomography for glaucoma. *Am J Ophthalmol*. 2012;153(5):815-826 e812.
7. Mwanza JC, Chang RT, Budenz DL, et al. Reproducibility of peripapillary retinal nerve fiber layer thickness and optic nerve head parameters measured with Cirrus HD-OCT in glaucomatous eyes. *Invest Ophthalmol Vis Sci*. 2010;51(11):5724-5730.
8. Budenz DL, Anderson DR, Varma R, et al. Determinants of normal retinal nerve fiber layer thickness measured by Stratus OCT. *Ophthalmology*. 2007;114(6):1046-1052.
9. Vazquez LE, Mwanza JC, Triolo G, et al. Analysis of arcade retinal nerve fiber bundle volume has greater diagnostic accuracy than nerve fiber layer thickness for detecting glaucoma. Poster presented at: American Glaucoma Society 26th Annual Meeting; March 5, 2016; Fort Lauderdale, FL.
10. Hood DC, Raza AS, de Moraes CG, Liebmann JM, Ritch R. Glaucomatous damage of the macula. *Prog Retin Eye Res*. 2013;32:1-21.

11. http://eyewiki.aao.org/Spectral_Domain_Optical_Coherence_Tomography_in_Glaucoma
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