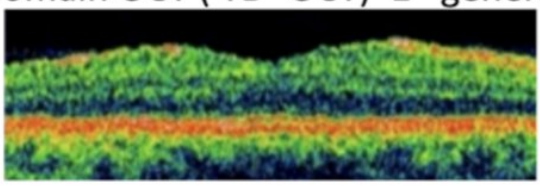
OCT

Principle of OCT:

MICHAELSON' S principle of LOW COHERENCE INTERFEROMETRY

Generation of OCT

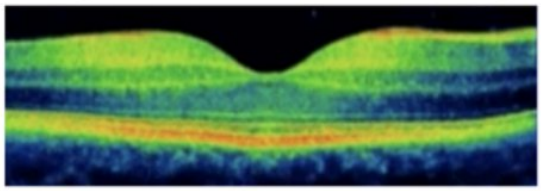
A. Time domain OCT (TD- OCT) 1st generation



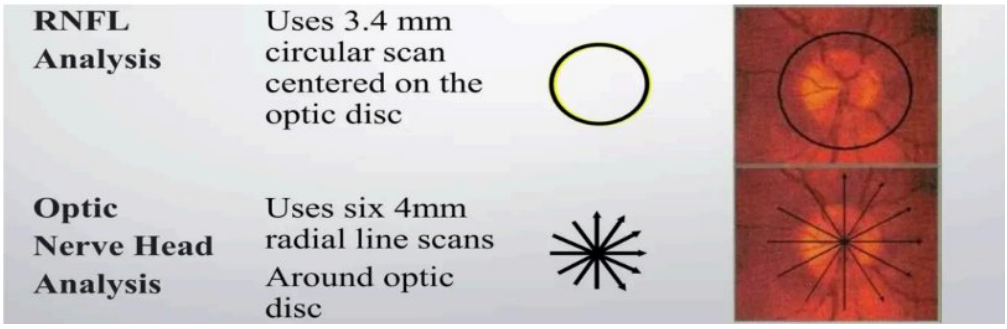
B. Fourier domain OCT

1) Spectral domain (SD - OCT) 2nd generation

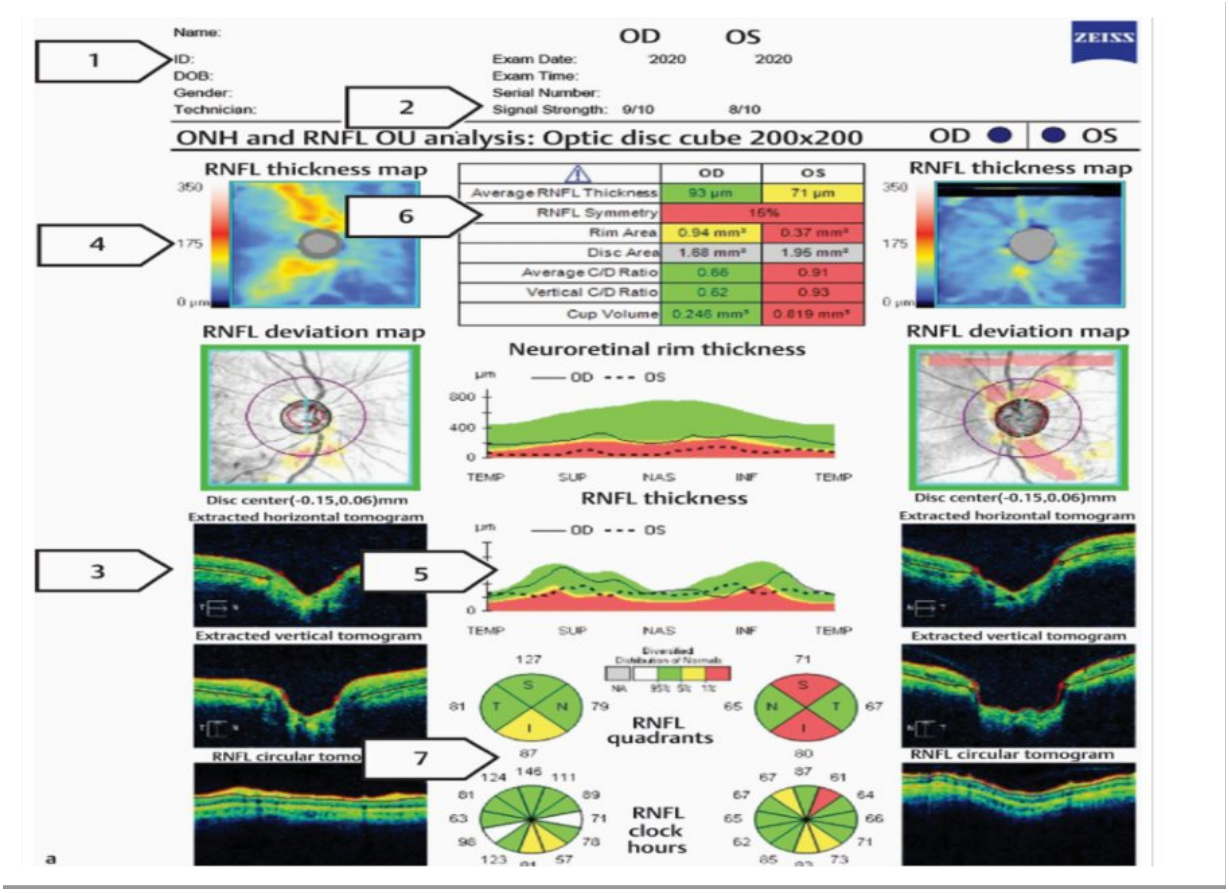
2) Swept source (SS – OCT) 3rd generation



OCT analysis for glaucoma



Interpreting OCT RNFL



1. **Patient Data and Date Of Birth** : The data is compared to age matched nomograms

2. **Signal strength**: Indicates if the quality of a scan is acceptable

Model (instrument)	Quality score range	Minimum acceptable score
Carl Zeiss Meditec (Cirrus)	0 to 10	>6
Topcon Medical Systems (3D OCT 1000)	0 to 160	>60
Heidelberg Engineering (Spectralis)	0 to 40	>15
Optovue (RTVue)	0 to 100	>30

3. **Segmentation:** Layers can be delineated improperly skewing the data

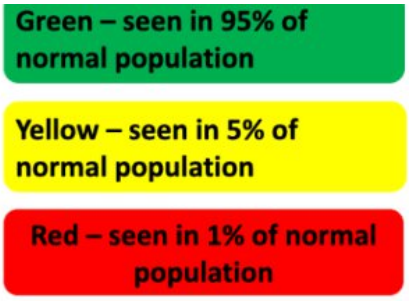
Red line delineated ILM and cup boundaries

Black line delineates RPE layer and disc boundaries

4. **RNFL Thickness maps:** Warmer colours corresponding to thicker values
   RNFL Deviation map highlights potential areas of RNFL loss when compared to normal.

Interpretation of the probability of abnormal values is aided by colour coding with red, yellow, green, and white shading.

RNFL thickness: Global average- by quadrant, and by clock-hour (7) is displayed.
The details are also presented in table (6) form, including degree of RNFL symmetry



ARTIFACTS:

1. Decentration
2. Motion Artifact
3. Segmentation error
4. Poor Signal
5. Red Disease
6. Green disease
7. Artifacts from pathologies unrelated to glaucoma eg: Peripapillary atrophy, Vitreo-macular traction

Conclusion:

OCT is an objective way to measure thickness of several parameters associated with glaucoma, ranging from ganglion cells, retinal nerve fibers layer to the neuro-retinal rim, progression etc. However, the results have to be interpreted carefully and in tandem with our clinical evaluation.