

Al-Azhar University
Cairo - Egypt



Egyptian Ophthalmological Society



Q Value .. Aspheric Ablation

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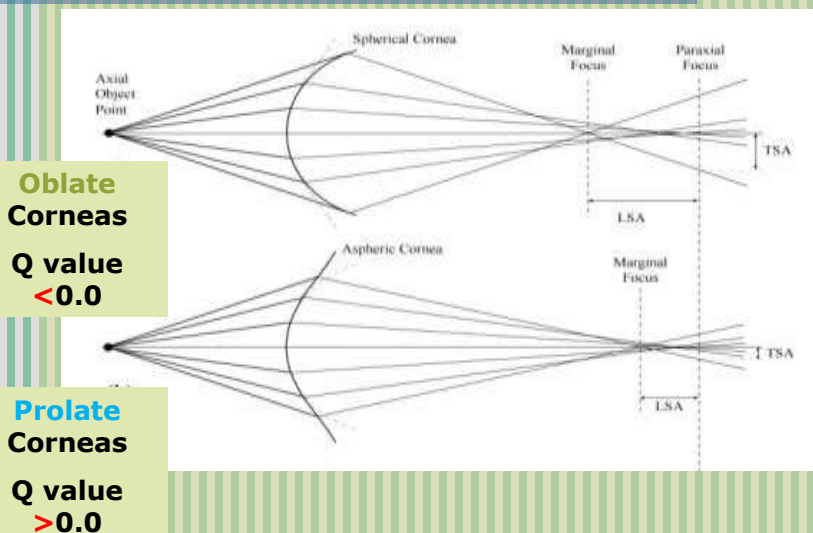
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The mystery Aspheric Cornea

- Steep center and flattens toward the periphery = "**Prolate**"
- *Prolate cornea*, central light rays focus **anterior** to the peripheral rays = "**-ve** spherical aberration."
- *Oblate cornea*, central light rays are focused **behind** the peripheral rays = "**+ve** spherical aberration"

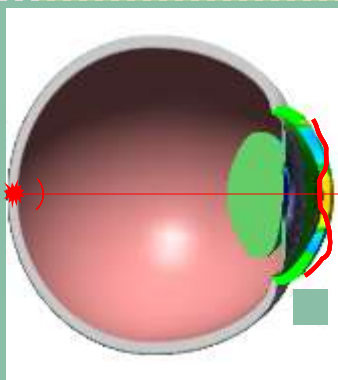
Prolate ... To focus each light ray



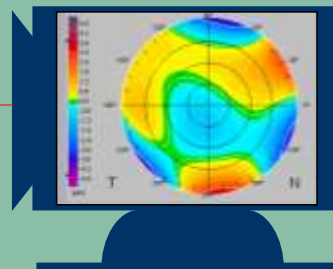
Q Value : Asphericity ratio

- Amount cornea peripherally flattened from apex
- Normal aspheric cornea has a Q factor between -0.20 & -0.45
- Q of zero = a completely spherical cornea
- $Q > \text{zero}$ corresponds to an oblate cornea = induces positive spherical aberration.
- The more Prolate = more negative spherical aberration.

Wavefront Distortion



Aberrometer

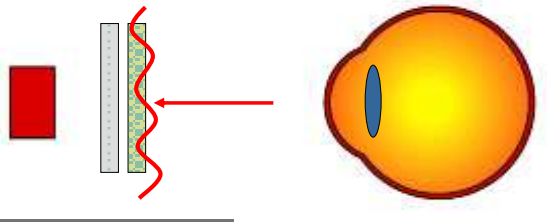


- irregular surface
- wide angle Kappa
- Inadequate Pupil size

Shack-Hartmann .. Post. Corneal mapping ... !!!!

Source
Near IR beam
800 nm

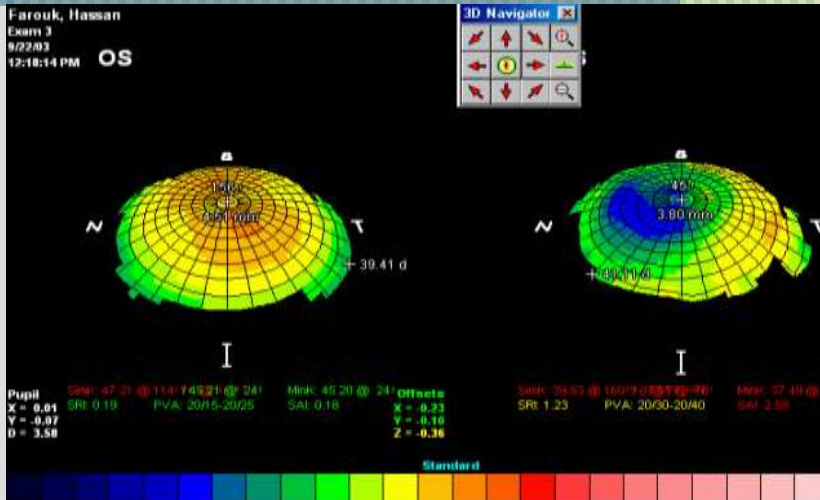
Lenslet Array



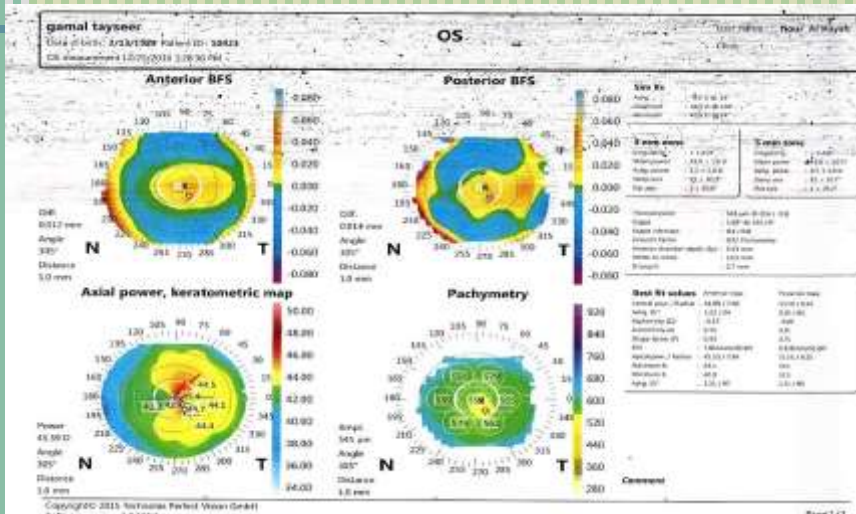
Capture
Charge-Coupled
Device Camera
(CCD)

Ocular distortion
of wavefront

In spite of all the technology Disastrous



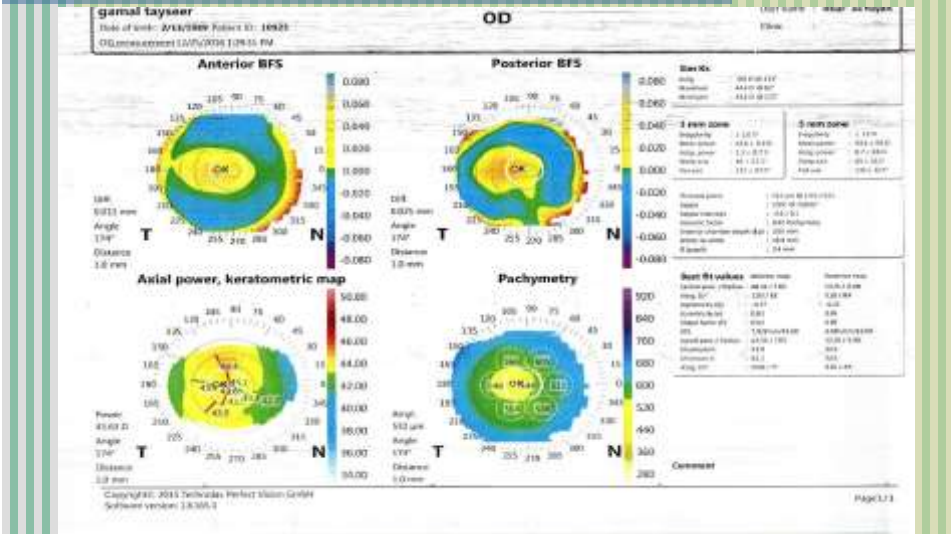
- 6.25 -2.25 x 170° A.C depth: 2.6



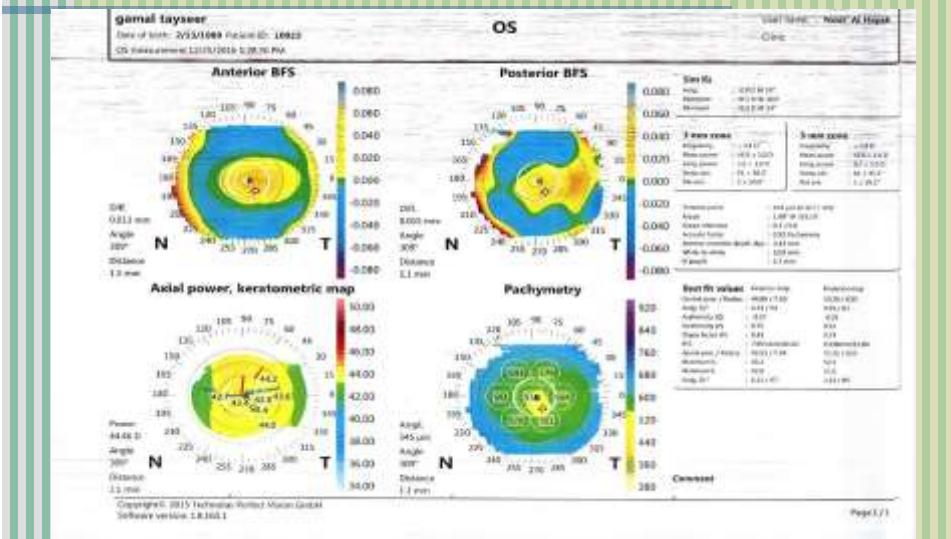
Because she has ... !!!



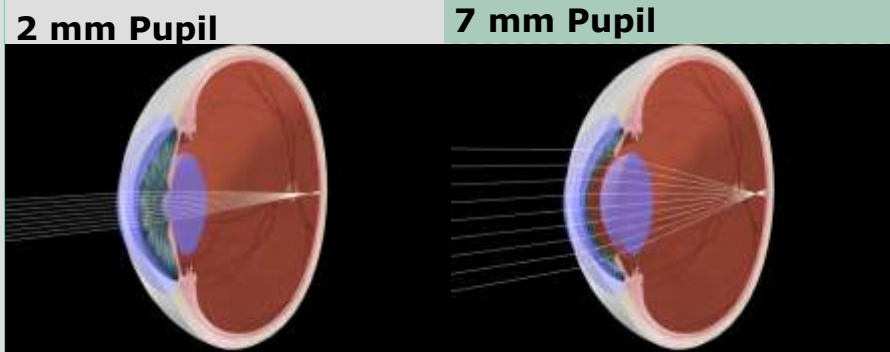
Q value adjusted ... Rt eye



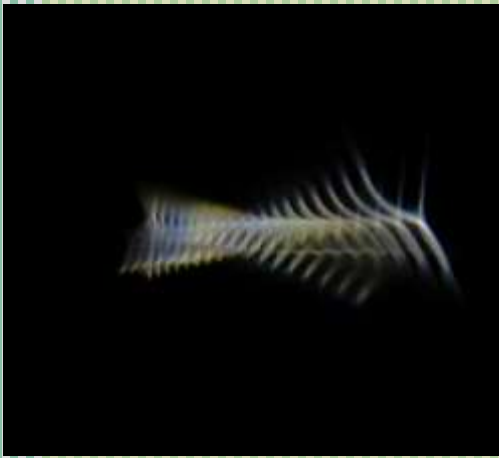
Q value Adjusted ... Lt eye



Influence of Pupil Size

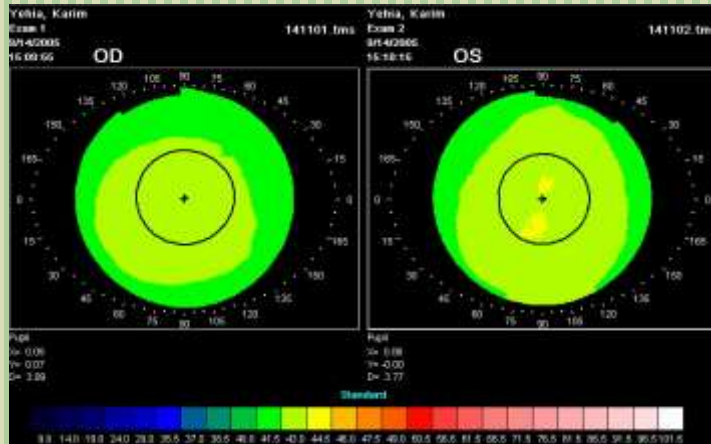


Big difference

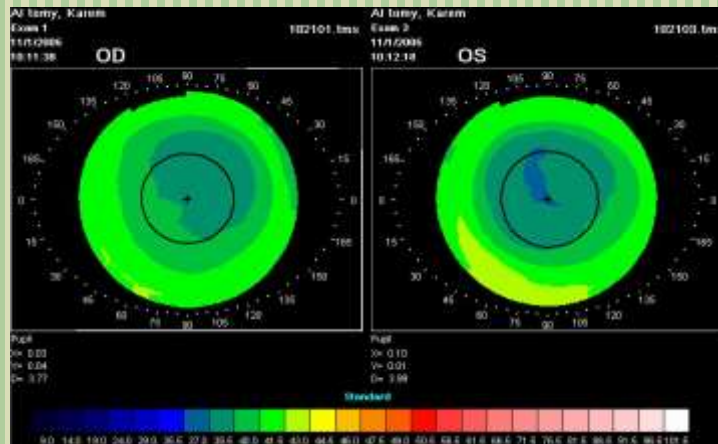


- Stretched Cone of Sturm reduces HO by 1/3 ... !!!

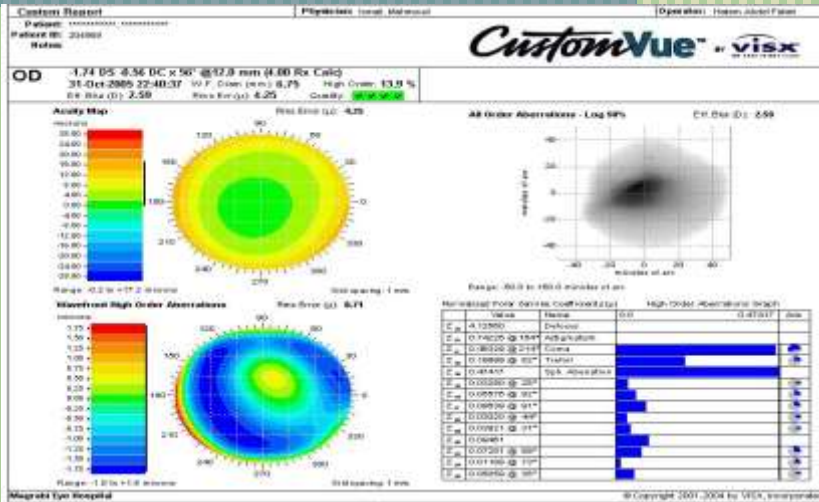
OD: -5.25 - 1.25 x 15
 OS: -5.50 - 1.50 x 165



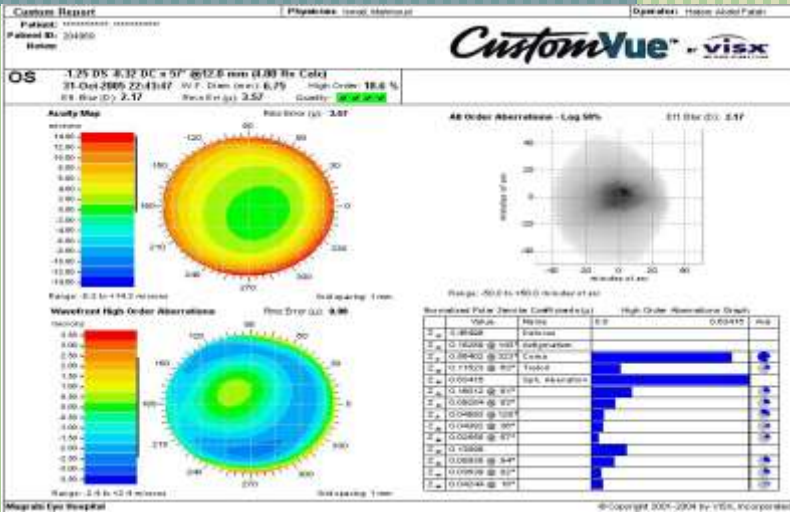
OD Pro-Scan
 OS Q Value Orientation



Postop. PSF Standard



Postop. PSF Q Value adj



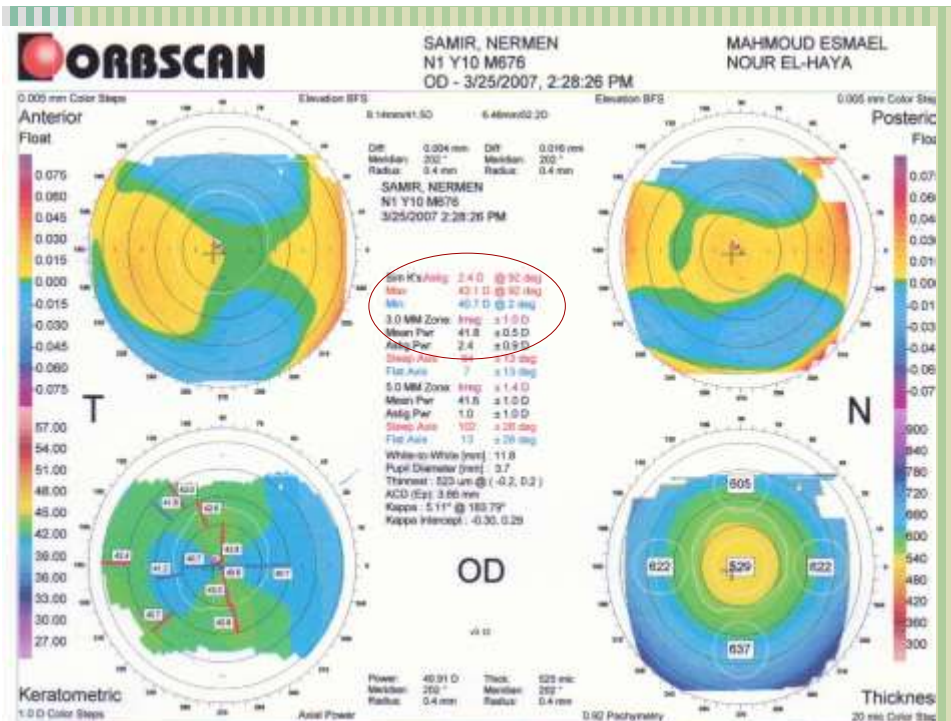
Wearing glasses

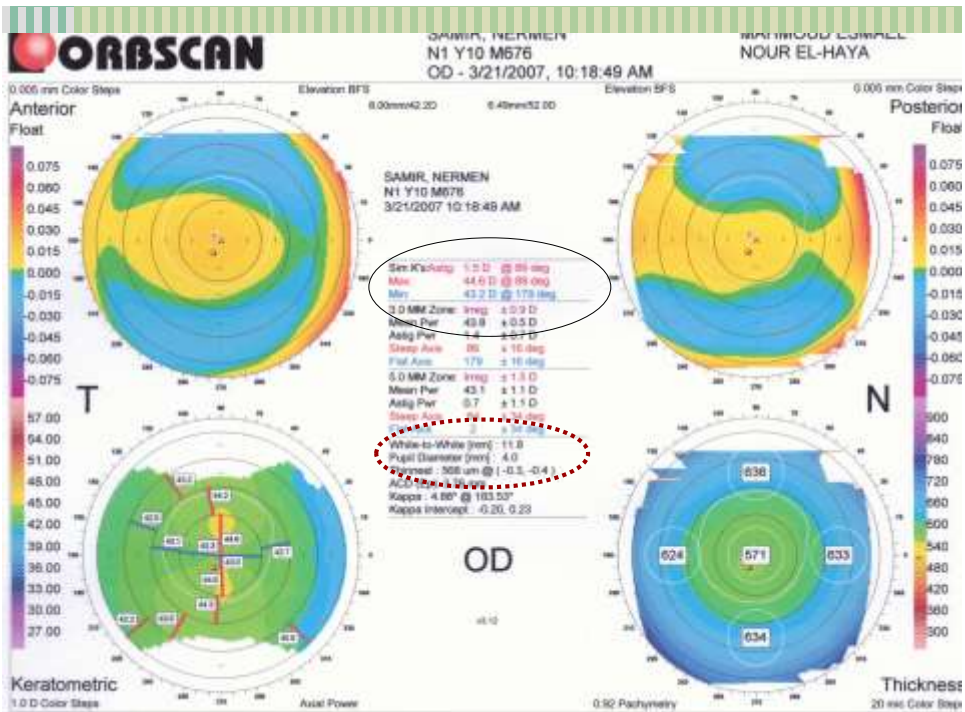
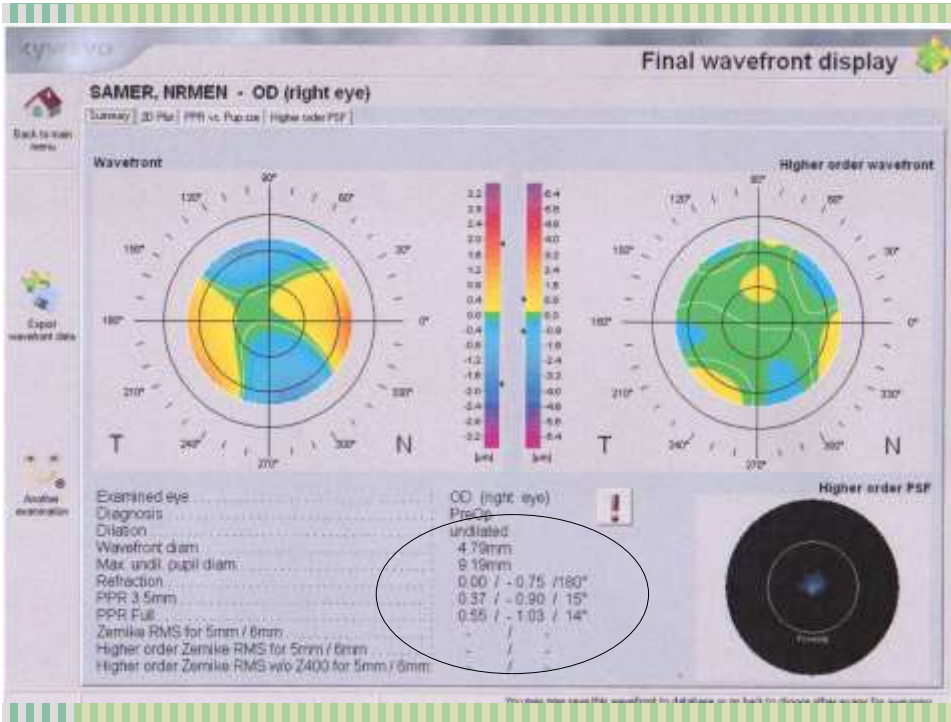
Rt eye

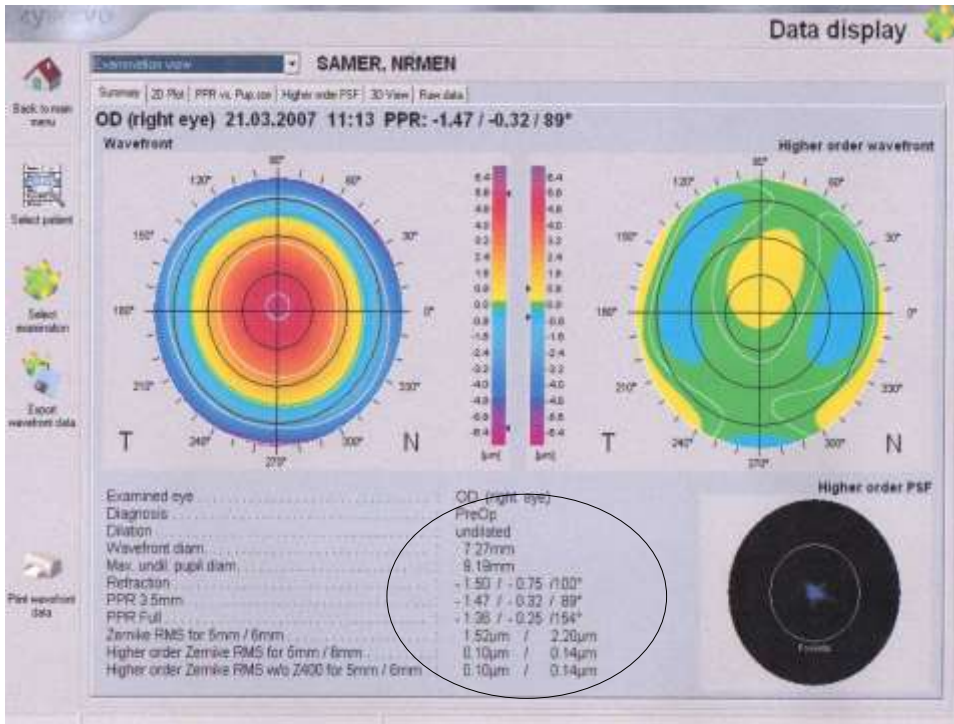
Lt eye

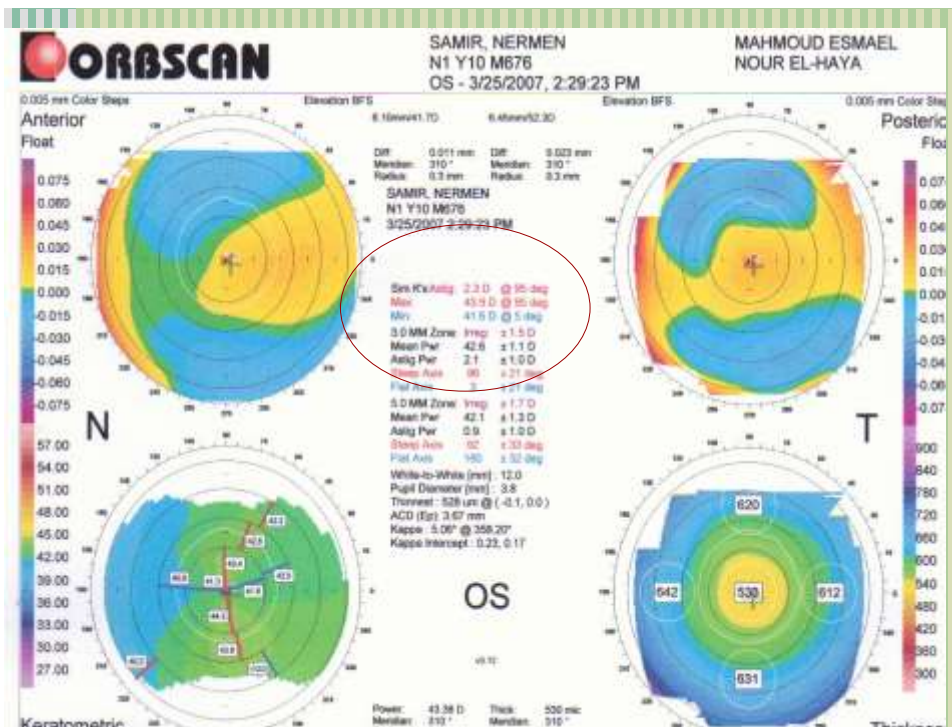
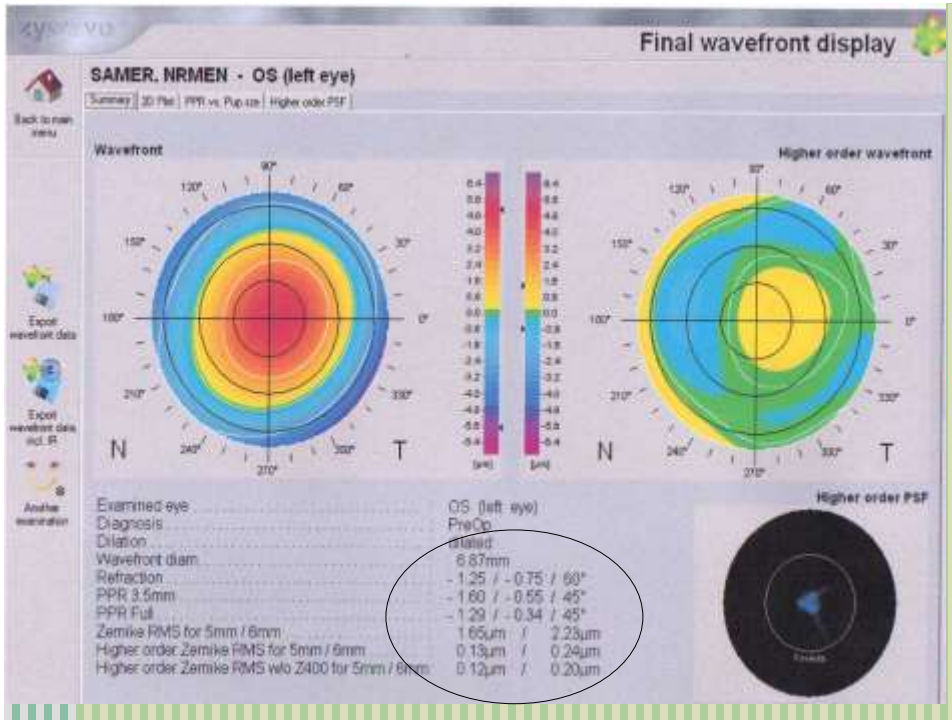
■ - 2 -0.75 x 100

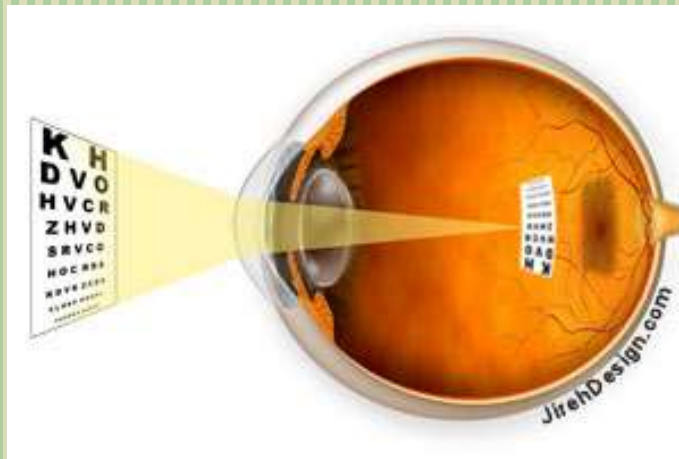
■ -1.75 -0.75 x 45











Q Value

- The cornea has positive SA, approx $+0.27 \mu\text{m}$ for a 6mm diameter