

Asphericity, Spherical Aberrations and Ablation Innovations

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David Santiago在OK镜、硬性透气角膜接触镜、圆锥形角膜领域有22年丰富临床实践经验。

Multi-dimensions, Multi-axes, Eye modeling

Eye is

- Dynamic
- Multiple axes
- Asymmetrical
- Multiple parameters
- Changing

Cornea

- More stable
- More symmetrical
- Less dynamic

What is important?

- Shape
- Orientation (axis)

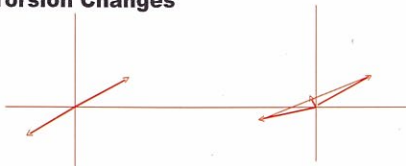
Multi-dimensional data acquisitions

- Refractive error measurement
- Correction Prescription (Gold standard)
- Corneal topography
- Pupilometry
- Wave front measurement
- Pachymetry
- Axes and Orientation
- Multi-dimensional Data alignment

Patient Positions and Alignment

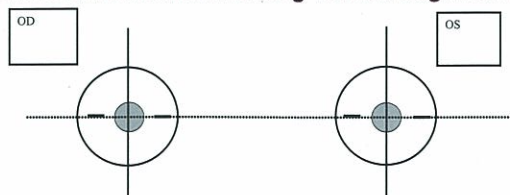
- The eye changes with
 - Sitting position
 - Supine position
- Torsion changes has marginal effect
 - Sphere, no effect
 - Cylinder, vector analysis, marginal residual astigmatism

Torsion Changes

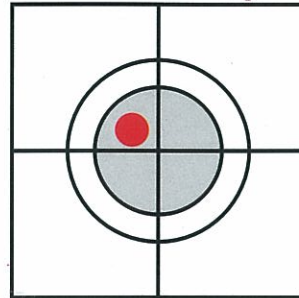


- Slight rotational error induces marginal residual astigmatism
- Torsion/rotational error does not change postop corneal vertex normal

Bilateral Horizontal Marking Torsion alignment



Ablation Center Changes



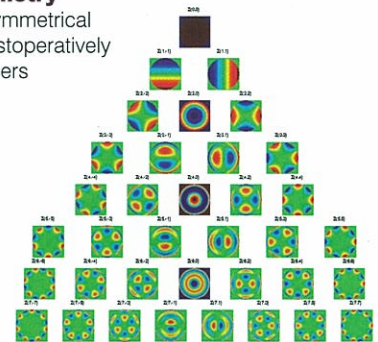
- Induce astigmatism
- Change of post-operative corneal vertex normal
- Cause rotation of eye post-operatively when fixating to a target
- Induce coma
- Induced astigmatism and coma most dramatic for oblate shape post-operatively

Laser Corneal Refractive Vision Correction Criteria

- Multi-parameter Optimization
- Because cornea is nice and symmetrical
- Create a normal post-operative cornea
- That maintains the shape and orientation

Get rid of asymmetry

- No significant asymmetrical Zernike terms postoperatively
- Optical zone matters



Coma

