

Understanding Your Patient's Complete Optical System



The Future Is Here Now
Advanced refractive technology represents a major clinical advance in the science of vision care. The tools are now available to provide a much higher level of care to every patient.

A Refractive Biopsy

The sum of OPD information provides the practitioner with a unique opportunity to understand all the components the patient's refractive system:

- Breaks down the source of visual error into lower (Sphere/Cyl) or higher order aberrations
- Identify location of aberration (Corneal vs Internal)
- Quantifies the magnitude of error
- Identifies if the refractive error is correctable
- Provides an explanation of what the patient is actually experiencing visually.

Advanced medical technology is being developed at a dizzying pace, however refraction and the way that we manage our patient's optical system has not changed much over the last century.....until recently. One advance that has been embraced over the last decade is the corneal topographer - an instrument that is quickly becoming the de-facto standard of care in corneal integrity and curvature measurement. Over the years topography has demonstrated the benefit of understanding the complete anterior corneal surface rather than just the central curvature at 4 points. Topography has established it's credentials as a diagnostic tool in offices across the country.

Refractive Map

Similar to the topographic map, the refractive map generated by NIDEK's OPD-Scan gives ocular aberrometer details of the overall refractive error (in diopters) across the patients complete optical system. The OPD-Scan takes 1440 measurements giving details never seen before.

The OPD Map, displays in diopters what the patient's refractive aberration is through their undilated pupil. In addition to displaying the refractive error as a colour-coded map, the average refractive error for the central 3 and 5mm zones are displayed.

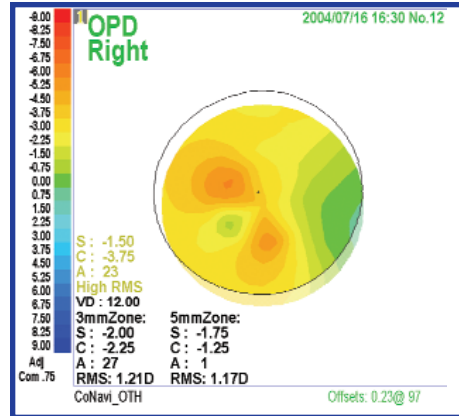


Figure 1

An OPD Map for a patient with irregular astigmatism. The approximation of the manifest refraction is shown as well as the refraction values for the central 3 and 5 mm zones. There is also an RMS value for each zone - over 1.00 in each zone, indicating that this patient has a high amount of uncorrectable irregularities

This highlights the regularity, or irregularity, of the optical system and will give the practitioner insight into the visual challenges faced by the patient.

Quantify Irregular Refractive Error

Irregular refractive errors that can not be corrected with sphere and cylindrical correction can be quantified by an RMS value that is calculated from the OPD map. The RMS value is considered similar to a "spherical equivalent" for irregular aberrations. A value of more than 0.50 is considered irregular and will have an effect on the patient's ultimate optical ability.

Breaking Refractive Error Down Into Components

In addition to providing a map of the patient's total refractive error, the OPD-Scan also includes a built-in topographer so that the corneal surface can be analyzed and understood. The incorporation of topography into the OPD-Scan measurements allows the OPD Map (the overall refractive error of the patient) to be referenced to the corneal topography. By referencing the two together, the contributions of the individual components of the optical system towards the overall refractive error can be quantified and presented graphically as seen in figure 2

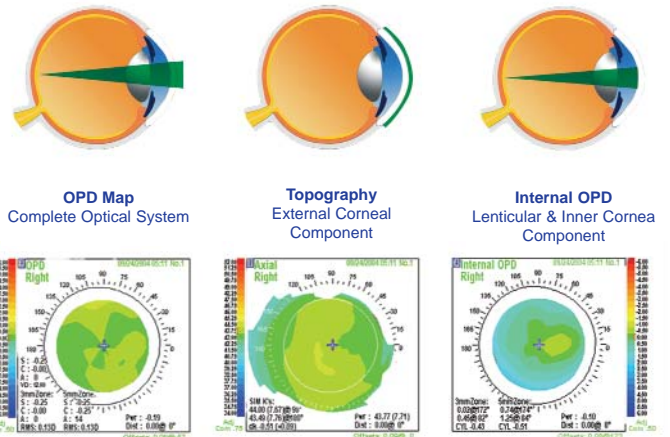


Figure 2

[Diagnostic]