iTrace

COMBINATION RAY TRACING ABERROMETER/TOPOGRAPHER

TRACEY™ TECHNOLOGIES

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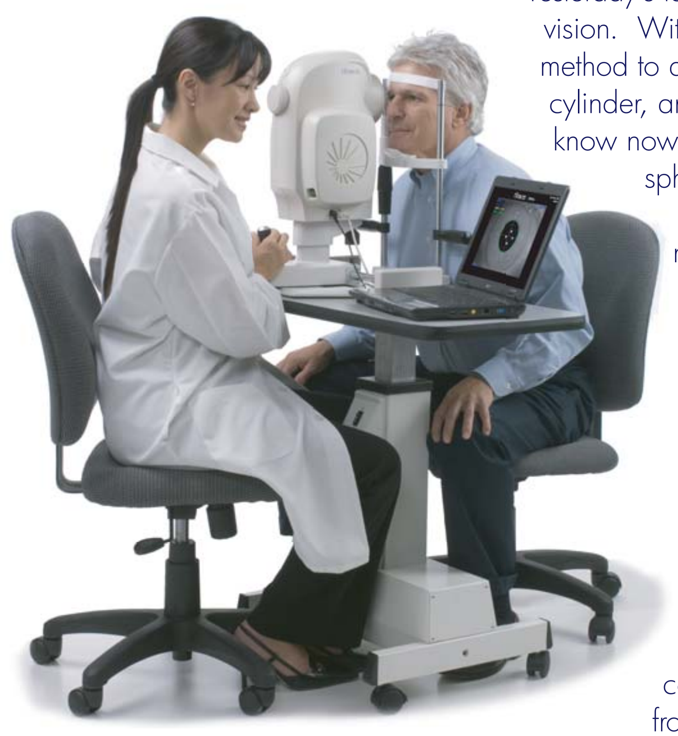


ABERROMETRY for Aberropia

Yesterday's terms of sphere and cylinder are no longer comprehensive enough to describe vision. With the advancements made in eye care in the last decades doctors needed a method to describe the visual disturbances that cannot be described as standard sphere, cylinder, and axis. Now, these values are known as lower order aberrations. We also know now that some patients are afflicted with higher order aberrations, such as coma, spherical aberration, trefoil, etc. (termed "aberropia"), and these patients will not achieve good vision with only lower order aberration correction. Doctors now realize that they need a comprehensive diagnostic tool, the aberrometer, to fully understand and treat higher order aberrations.

THE SCIENCE Behind the iTrace

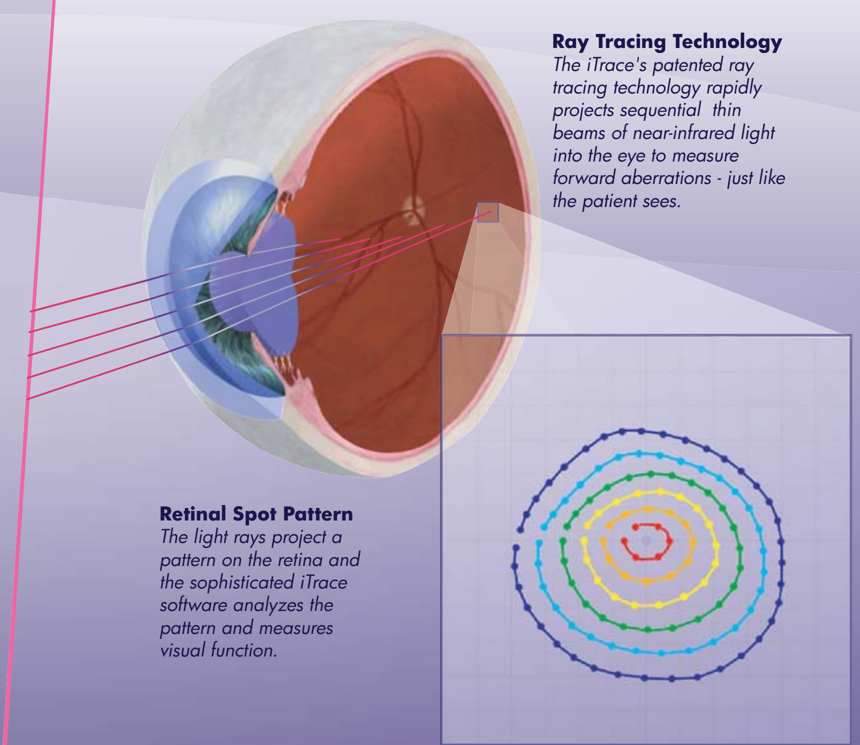
The iTrace uses the principle of ray tracing that was developed from space and defense industry applications to track satellites and missiles. Tracey Technologies adapted this concept for eye care to objectively measure the total refractive power of the eye. Unlike other wavefront systems, the iTrace has the unique capability to assess complete visual function and quality of vision using the fundamental thin beam principle of ray tracing, a first in eye care diagnostics. The iTrace measures forward aberrations that are generated from light rays refracting at the cornea, passing through the entrance pupil, and striking the retina (just like natural vision). The iTrace measures both lower and higher order ocular aberrations - achieving a new level of accuracy, speed and dynamic range not possible with conventional refractive techniques.

RAY TRACING the Technology

The iTrace is the most accurate aberrometer available today. The iTrace rapidly projects 256 sequential, parallel thin laser light beams through the pupil within milliseconds. Charting the precise position where each of the beams land on the retina, the iTrace integrates these retinal spot positions to measure overall visual performance. Powerful software tools generate graphical displays of the data to provide complete analysis of the patient's visual function.

Ray Tracing differs from other methods for measuring aberrometry. Other methods, particularly Hartmann-Shack-based systems use technology developed for measuring telescopes. However, human eyes are dynamic rather than static visual systems like telescopes, therefore human eyes require a dynamic measuring technology like ray-tracing. Ray-tracing also eliminates data confusion, a particular problem with Hartmann-Shack devices. The iTrace knows where each individual beam lands on the retina and can graph and measure with confidence in the location of the spot.

Also, ray-tracing aberrometry measures forward aberrations, just like natural vision. Other aberrometers measure aberrations after the light reflects off of the retina and passes back through the visual system. Measuring forward provides is a more realistic approach to aberration analysis.



Ray Tracing Technology
The iTrace's patented ray tracing technology rapidly projects sequential thin beams of near-infrared light into the eye to measure forward aberrations - just like the patient sees.

Retinal Spot Pattern
The light rays project a pattern on the retina and the sophisticated iTrace software analyzes the pattern and measures visual function.

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System Specifications

Measurement Range:	+/-15 D sphere +/-10 D cylinder
Pupil Scan Size:	2.5 mm to 8 mm diameter
Accuracy:	+/- 0.10 D
Reproducibility:	+/- 0.10 D
Footprint Dimensions:	13 in (33 cm) x 17 in (43.2 cm)
Weight (incl. base plate, manipulator and chinrest):	27.4 lb (20 kg)
Options:	Laptop computer Motorized table iTrace Travel Case Accommodation Kit

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