

# Combining Autorefraction, Subjective Refraction in the Same Device

A reliable, efficient solution to standardized screening.

BY GARY WORTZ, MD

Achieving optimal visual outcomes in patients requires careful measurement of their refractive error. Typically, this is achieved by assessing objective refraction using a retinoscope or autorefractor and subjective refraction using a phoropter. In recent years, a number of developments have allowed eye specialists to measure both objective and subjective refraction with one device. This method enables the user to refine the results of objective autorefraction with subjective refraction without moving the patient.

An example of such a device is the Topcon KR-800S Auto Kerato/Refractometer (Figure 1). The KR-800S incorporates subjective visual acuity testing for far and near distance along with the latest autorefraction technology.

Additionally, the KR-800S incorporates glare testing, grid testing, and contrast sensitivity testing, features helpful for ascertaining whether a patient is a candidate for cataract surgery and determining the presence of macular pathologies.

## AUTOREFRACTION, SUBJECTIVE REFRACTION COMBINED

The KR-800S allows the eye care provider to perform

both autorefraction and subjective refraction, fine-tuning the refraction at the same device. This “one stop shop” approach is particularly beneficial for satellite clinics that do not have a range of technologies at their disposal.

The objective refractor mode provides a sphere range of -25.00 D to +25.00 D in 0.12 D/0.25 D increments and a cylinder range of 0.00 D to 10.00 D in 0.12 D/0.25 D steps. The subjective measurement mode offers a sphere range of -18.00 D to +18.00 D in 0.25 D steps and a cylinder range of 0.00 D to 8.00 D in 0.25 D steps.

## EASE OF USE

The device is easy to operate. It features a wide, 8.5-inch color touch screen panel with clear, easy-to-read icons. The weight of the unit has been reduced 23% compared with the previous iteration, the KR-800. The lighter device contributes to smoother operation, a more fluid measuring process, and more accurate results.

Only minimal training is required to become proficient with the KR-800S. In fact, someone with little or no training should be able to refract a patient with a high degree of accuracy within less than 30 minutes.



Figure 1. The KR-800S Auto Kerato/Refractometer incorporates subjective visual acuity testing along with autorefractometry.

### ADDITIONAL BENEFITS

The device also offers glare and contrast sensitivity testing, features not present in many autorefractors. These functions are particularly important for refracting cataract patients. Under normal lighting conditions, cataract patients may seem to have very good vision; at night, however, they may see halos around car headlights or streetlights. Glare testing helps to identify patients who may be candidates for cataract surgery despite relatively good vision on a Snellen eye chart. Contrast sensitivity testing, which detects an individual's ability to differentiate between increments of light and dark, is also beneficial for evaluating cataract patients. Contrast testing allows the practitioner to better understand what the patient is seeing under various lighting conditions.

The KR-800S also incorporates grid testing, important for identifying and diagnosing macular pathologies such as age-related macular degeneration and epiretinal membrane. This feature allows the user to quickly and easily identify patients with macular disorders that may otherwise go undetected. It also serves as a screening tool for patients interested in pursuing premium IOL implantation. An abnormality in the grid test alerts the user that diabetic macular edema, macular degeneration, vitreomacular traction, or an epiretinal membrane may be present.

The device incorporates Topcon's proprietary rotary prism technology (Figure 2), which allows unparalleled precision and reliability. The simplicity of the KR-800S may also help to improve practice productivity. Because

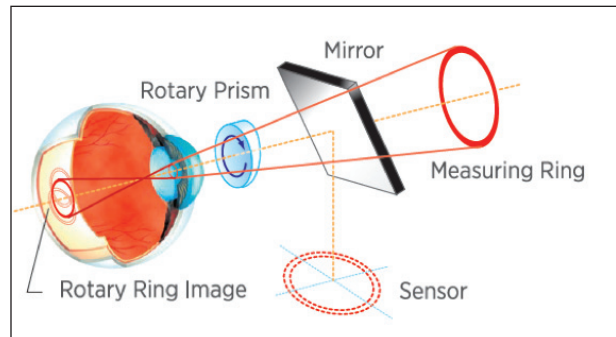


Figure 2. Topcon's proprietary rotary prism technology.

Topcon technology is reliable, accurate and easy to use, technicians can perform first-line refraction with the device. The device allows the operator to reach a refractive endpoint very quickly.

### STREAMLINING PRACTICE

The KR-800S has helped me and my staff to streamline our practice. In the past, a technician would perform a standard autorefractometry on a patient and then refine the refraction in the examination lane. Visual acuity, contrast and glare testing would then be performed on patients with cataract symptoms. It seemed, however, that the glare acuity results would be variable depending on the technician's technique, the brightness of the room lights, the brightness of the chart, and the relative brightness of the Brightness Acuity Tester (Marco). Also, junior technicians were not always adept at identifying patients' complaints related to cataracts.

I insist on glare testing being performed prior to dilation, and many times, I needed patients to return for a glare test to properly determine their candidacy for cataract surgery. Consequently, I needed a reliable, efficient solution to screen patients in a standardized way, and the KR-800S has provided a perfect solution to this problem.

### SUMMARY

Although the KR-800S is particularly beneficial in assessing patients for cataract surgery, it can also be used before other forms of eye surgery to accurately determine a patient's visual potential. Its five-in-one functionality combined with ease of use also helps to improve practice efficiency, making it relevant to a variety of eye care applications. ■

Gary Wortz, MD, is a cataract and refractive surgeon at Koffler Vision Group in Lexington, Kentucky. He is a consultant to Topcon. Dr. Wortz may be reached at [gary@omegalens.com](mailto:gary@omegalens.com).

